DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•

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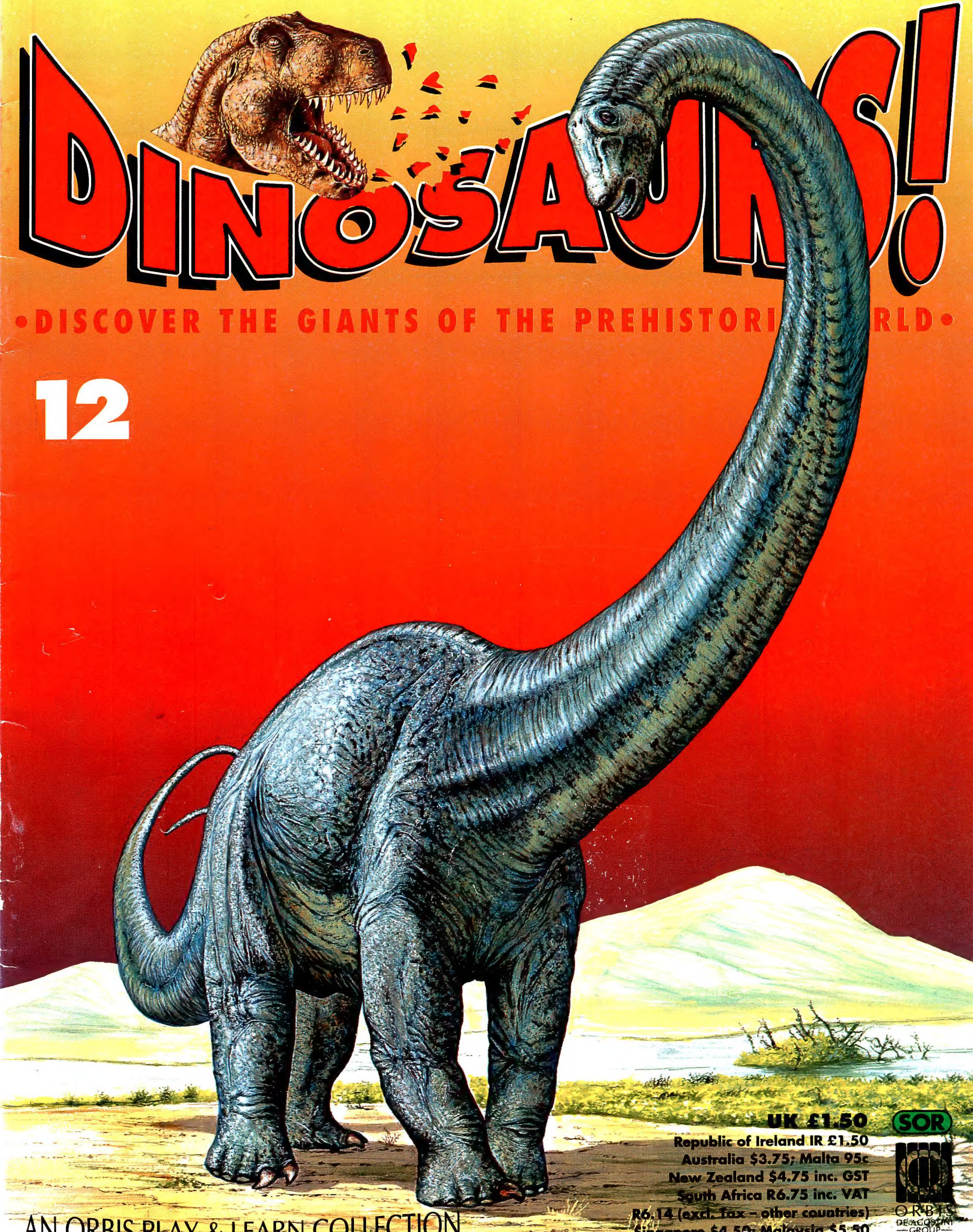

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

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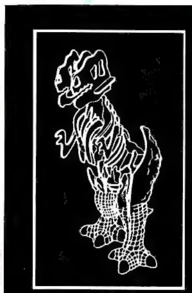
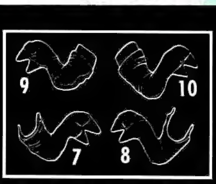
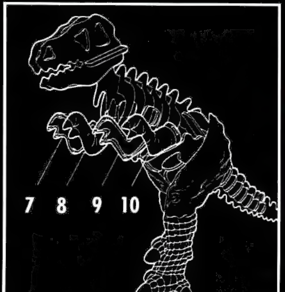


▲ Assembled model from Part 11



▲ This issue's model parts
Model part 7 – outside front right leg
Model part 8 – inside front right leg
Model part 9 – outside front left leg
Model part 10 – inside front left leg

With the front body leg pointing forward, hold model parts 7 and 8 either side of the skeleton's right front leg. Insert the pins on the outside front right leg into the holes on the inside front right leg. Repeat using the inside and outside front left legs.



◀ How to assemble this issue's model parts

▲ Your complete *T rex* model

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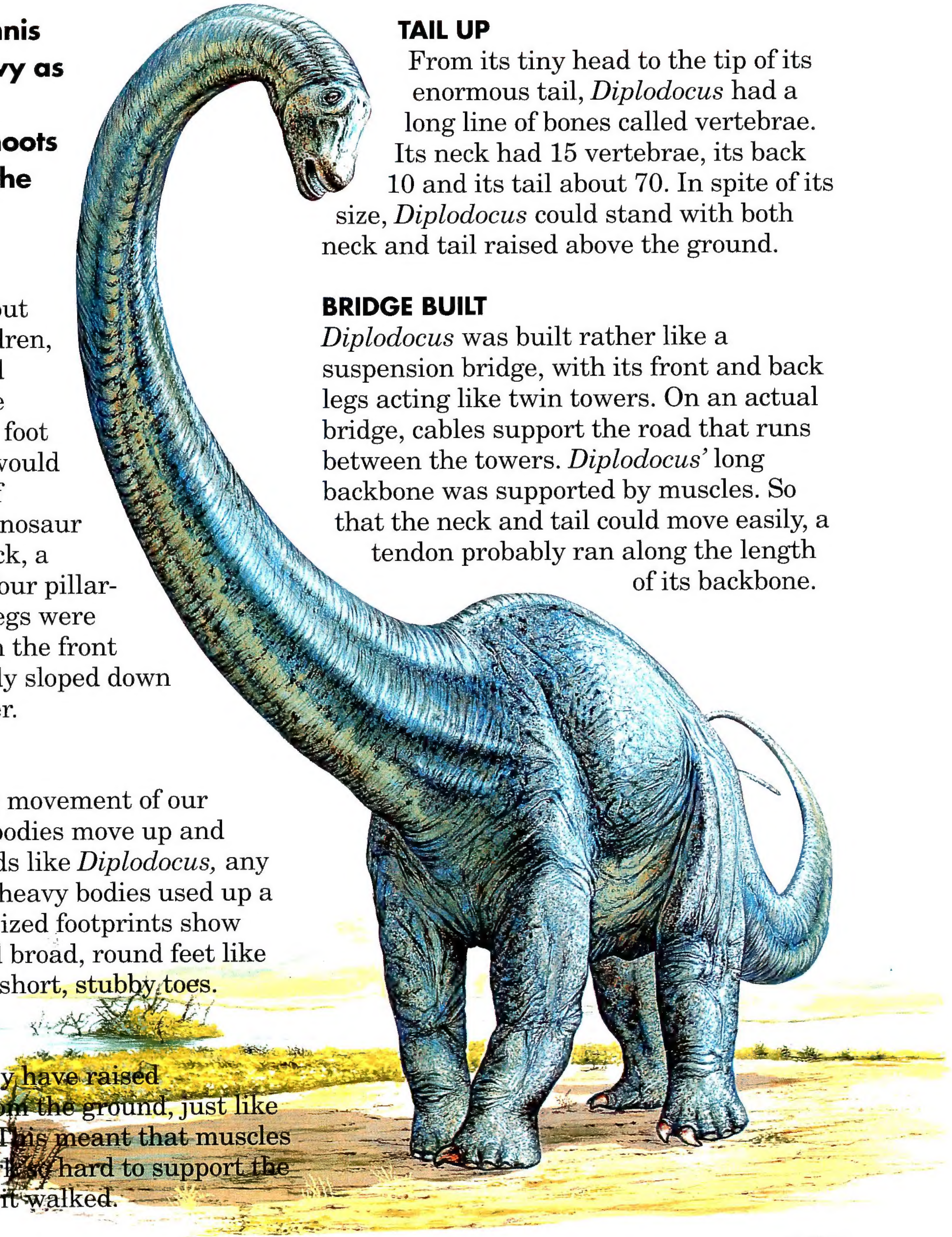
DIPLODOCUS

Longer than a tennis court and as heavy as two elephants, *Diplodocus* ate shoots from the tops of the tallest trees.



Take about 20 children, all aged around 10 years, lie them down head to foot and together they would match the length of *Diplodocus.* This dinosaur had a long, thin neck, a whip-like tail and four pillar-like legs. Its back legs were slightly longer than the front pair so that the body sloped down from hip to shoulder.

ELEPHANT FEET

When we walk, the movement of our ankles makes our bodies move up and down. For sauropods like *Diplodocus,* any movement of their heavy bodies used up a lot of energy. Fossilized footprints show that sauropods had broad, round feet like an elephant's with short, stubby toes.

WELL-HEELED

A sort of wedge may have raised *Diplodocus*' toes from the ground, just like the heel of a shoe. This meant that muscles did not have to work so hard to support the dinosaur's body as it walked.

TAIL UP

From its tiny head to the tip of its enormous tail, *Diplodocus* had a long line of bones called vertebrae. Its neck had 15 vertebrae, its back 10 and its tail about 70. In spite of its size, *Diplodocus* could stand with both neck and tail raised above the ground.

BRIDGE BUILT

Diplodocus was built rather like a suspension bridge, with its front and back legs acting like twin towers. On an actual bridge, cables support the road that runs between the towers. *Diplodocus*' long backbone was supported by muscles. So that the neck and tail could move easily, a tendon probably ran along the length of its backbone.

Is it true that the giant sauropods stood upright?

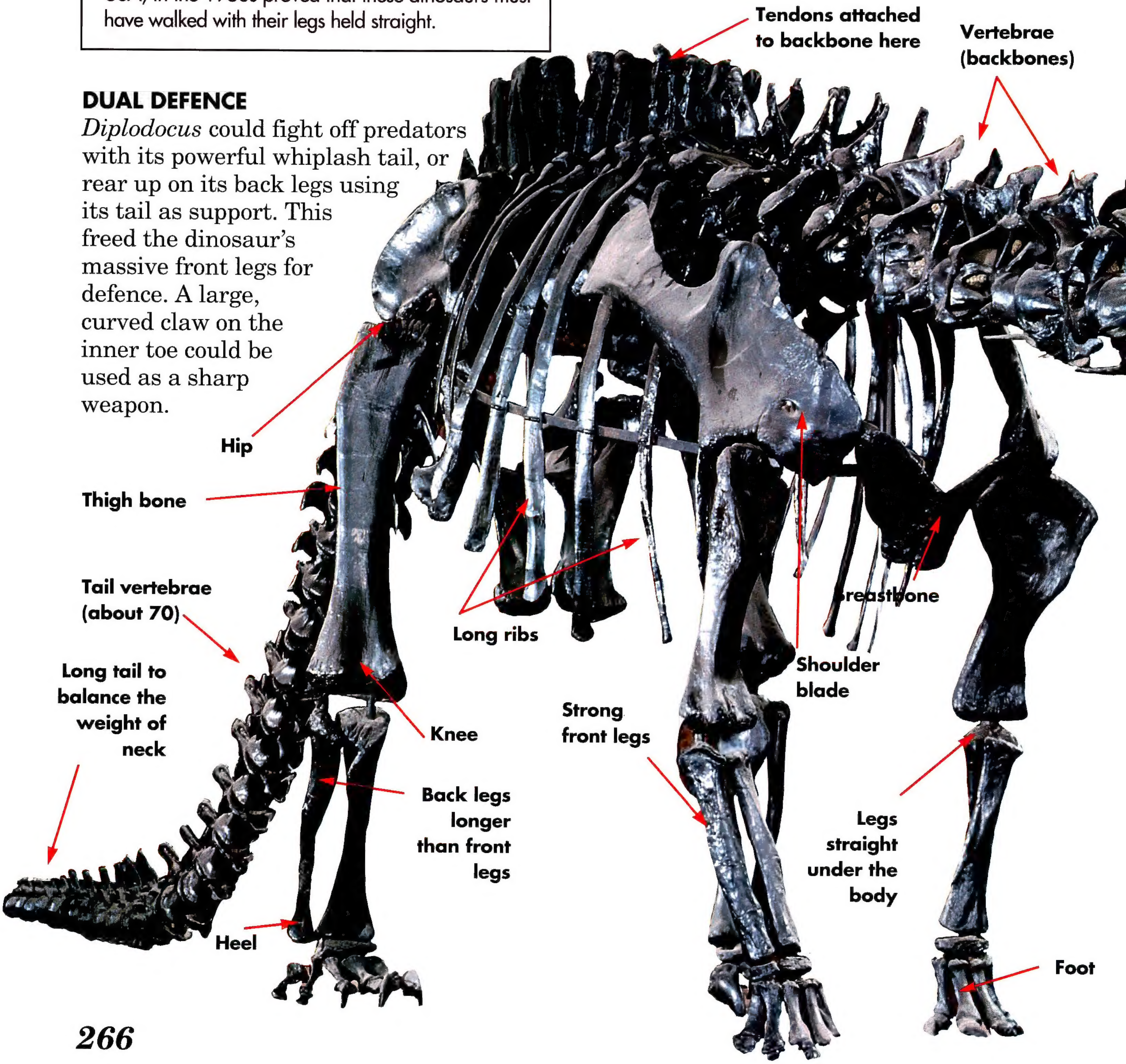
Some scientists once thought that sauropods crept along like lizards with legs sprawled on each side of their body and chest close to the ground. However, footprints found in Texas, USA, in the 1930s proved that these dinosaurs must have walked with their legs held straight.

STICKING ITS NECK OUT

Diplodocus' neck was not as long as that of its Chinese cousin, *Mamenchisaurus*. At 11m, *Mamenchisaurus'* neck was just a bit longer than a bus. *Diplodocus'* neck was only 7.5m long and its enormous weight was balanced by a long tail, which stopped the giant from tipping over.

DUAL DEFENCE

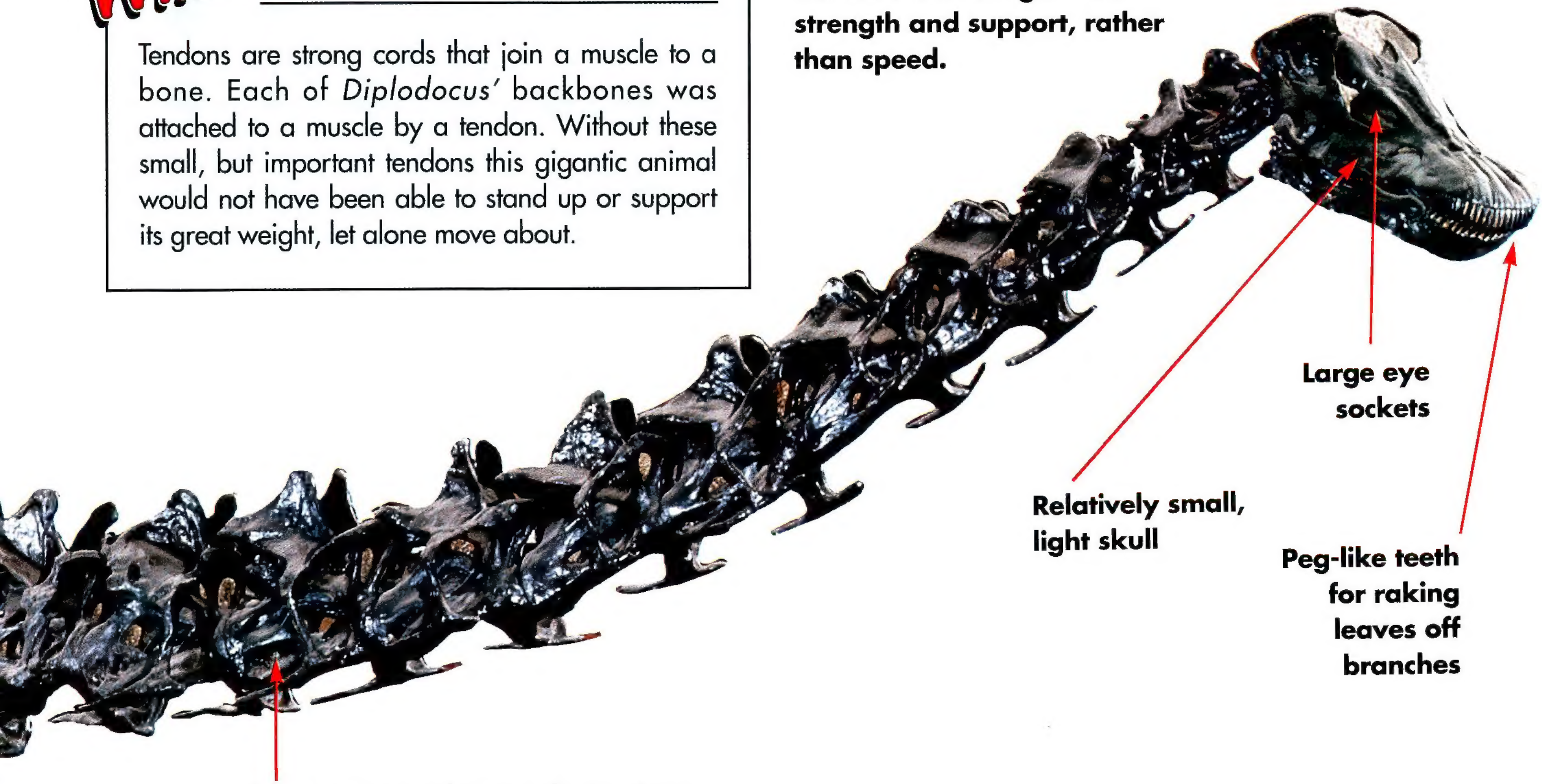
Diplodocus could fight off predators with its powerful whiplash tail, or rear up on its back legs using its tail as support. This freed the dinosaur's massive front legs for defence. A large, curved claw on the inner toe could be used as a sharp weapon.


Tendons attached to backbone here
Vertebrae (backbones)
Hip
Thigh bone
Tail vertebrae (about 70)
Long tail to balance the weight of neck
Long ribs
Breastbone
Shoulder blade
Knee
Strong front legs
Back legs longer than front legs
Legs straight under the body
Heel
Foot

What is? A TENDON

Tendons are strong cords that join a muscle to a bone. Each of *Diplodocus'* backbones was attached to a muscle by a tendon. Without these small, but important tendons this gigantic animal would not have been able to stand up or support its great weight, let alone move about.

The bones that were hidden beneath *Diplodocus'* skin and muscle were designed for strength and support, rather than speed.



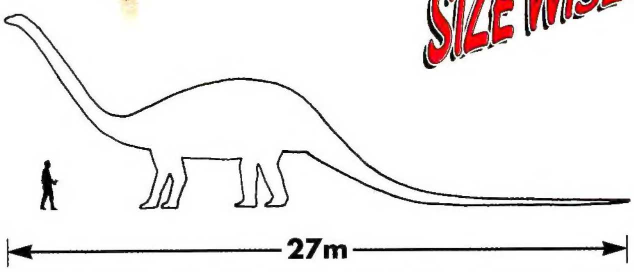
Large eye sockets

Relatively small, light skull

Peg-like teeth for raking leaves off branches

Long neck used to reach tree-tops

SIZE WISE



MONSTER FACTS

- **NAME:** *Diplodocus* (dip-lod-oh-kus) means 'double beam'
- **SIZE:** 27m long and 3.6m high
- **FOOD:** plants and leaves from trees
- **LIVED:** 150 – 138 million years ago in the Late Jurassic Period in North America

BIG FIND

At the end of the last century, a Scottish-American millionaire, Andrew Carnegie, was determined to have a giant dinosaur in his museum in Pittsburgh, USA. To his delight, a team of fossil collectors working for him at Sheep Creek, Wyoming, found two *Diplodocus.* A massive skeleton was made from the remains and called *Diplodocus carnegiei.*

ROYAL REPLICA

When the King of England, Edward VII, saw a painting of *Diplodocus* in Carnegie's Scottish home, he asked if a copy of the skeleton could be made for Britain. A cast of the skeleton took two years to complete and in 1905 the replica was finally put together at the Natural History Museum in London, England.

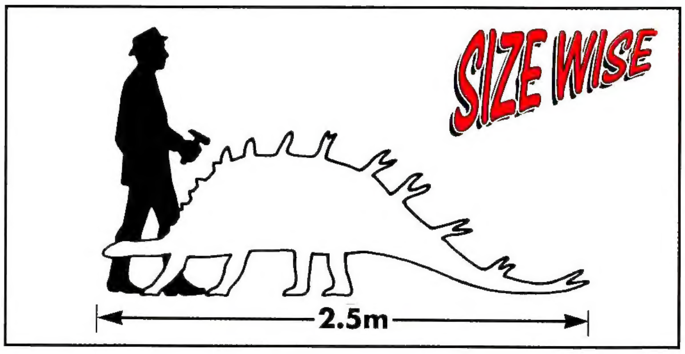
KENTROSAURUS

A sharp spike on each shoulder of this dinosaur gave it extra protection from large predators.

Kentrosaurus grazed on low-growing plants with its small head close to the ground. It walked on four chunky legs that carried its heavy body. *Kentrosaurus* lived at the same time as *Stegosaurus,* but was only about a quarter of that dinosaur's size.

SPECIAL SPIKES

All along its back and tail, *Kentrosaurus* had a double row of armour. Near the front of its back, the spikes were quite flat. They became more narrow and pointed from its middle to the end of its tail. An extra spike pointed out and downwards on each of the dinosaur's shoulders. *Kentrosaurus* may have used its sharp spikes to defend itself rather like today's porcupines do.



MONSTER FACTS

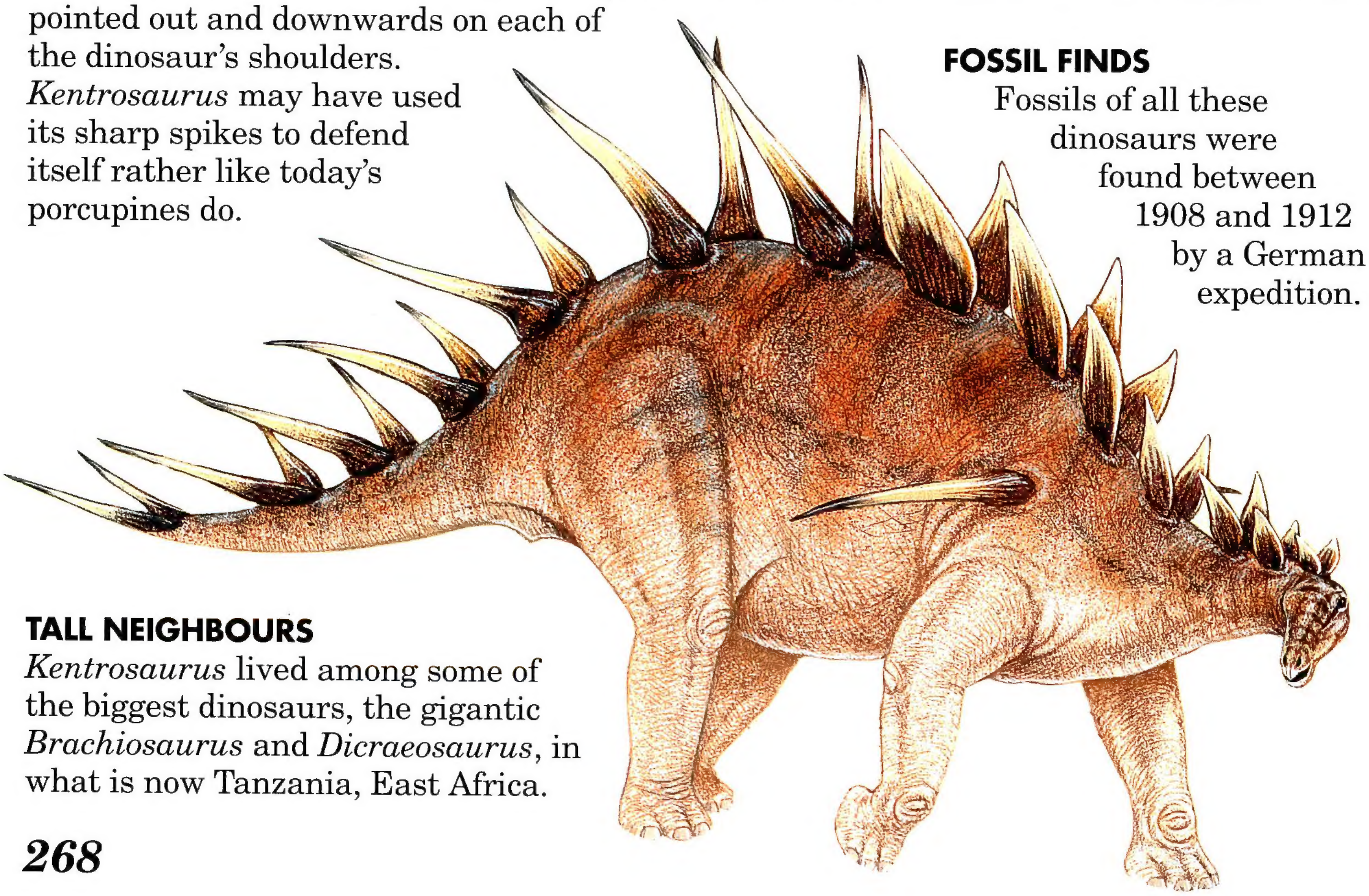
- **NAME:** *Kentrosaurus* (ken-tro-saw-rus) means 'spiky lizard'
- **SIZE:** 2.5m long and about 1m high
- **FOOD:** low-growing plants
- **LIVED:** 150 – 140 million years ago in the Late Jurassic Period in Tanzania, East Africa

FOSSIL FINDS

Fossils of all these dinosaurs were found between 1908 and 1912 by a German expedition.

TALL NEIGHBOURS

Kentrosaurus lived among some of the biggest dinosaurs, the gigantic *Brachiosaurus* and *Dicraeosaurus*, in what is now Tanzania, East Africa.



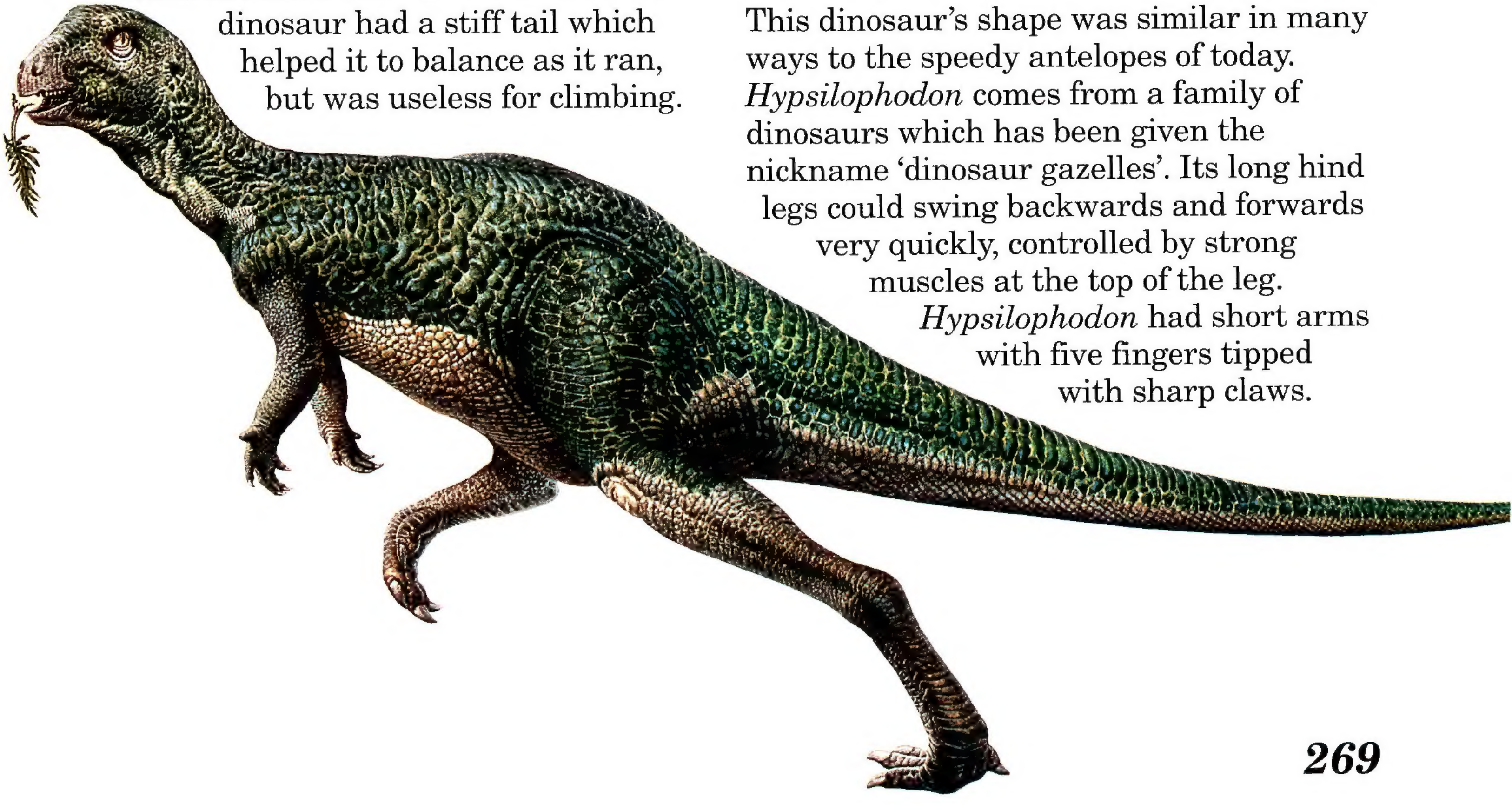
HYPSILOPHODON

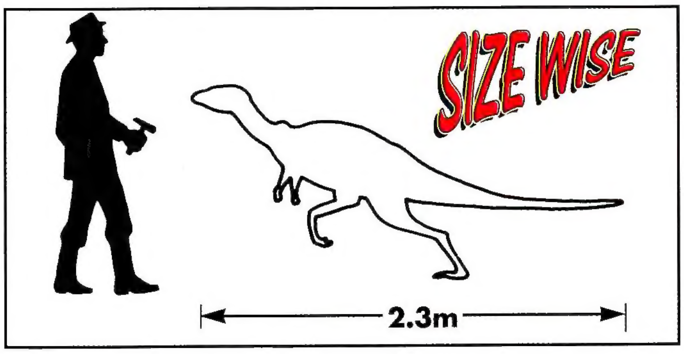
It was once thought that this small, speedy dinosaur lived in trees.

Hypsilophodon had sharp eyes set in a sheep-like head. It roamed the forests of Europe and North America during the Early Cretaceous Period, using its horny beak to nip off shoots and the short teeth at the sides of its mouth to chew them up.

LIVING IN TREES?

Scientists once thought that *Hypsilophodon* had feet like a bird's so that it could grasp branches. They believed that the first toe pointed backwards and the other three toes pointed forwards, like a bird's. Now, experts think that all the toes pointed forwards, which means that the dinosaur could not have held on to a branch. The dinosaur had a stiff tail which helped it to balance as it ran, but was useless for climbing.





MONSTER FACTS

- **NAME:** *Hypsilophodon* (hip-see-loaf-oh-don) means 'high ridged tooth'
- **SIZE:** between 1.4 and 2.3m long
- **FOOD:** plants
- **LIVED:** 115 – 110 million years ago in the Early Cretaceous in North America and Europe

FAST FOOTED

This dinosaur's shape was similar in many ways to the speedy antelopes of today. *Hypsilophodon* comes from a family of dinosaurs which has been given the nickname 'dinosaur gazelles'. Its long hind legs could swing backwards and forwards very quickly, controlled by strong muscles at the top of the leg. *Hypsilophodon* had short arms with five fingers tipped with sharp claws.

Pterosaur success

Successful in the skies for 166 million years, pterosaurs were good fliers. But how did the pterosaurs of the Late Jurassic and Early Cretaceous move on the ground and what did they eat?

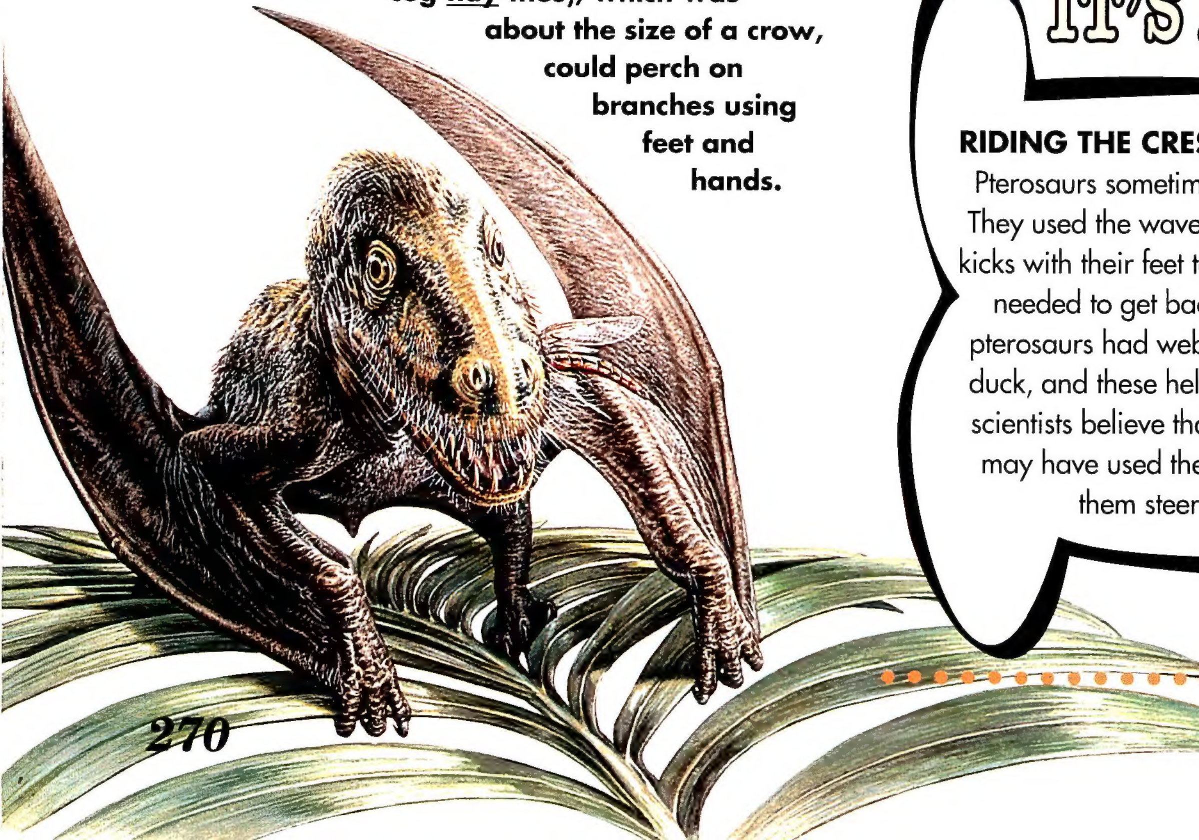
Although all pterosaurs flew well, scientists are not sure how they got about on the ground. For years, pterosaurs were thought to be like bats or birds, but scientists now realise that they were not built like any other known group of animals. This makes it difficult to understand how they moved because there is nothing to compare their bones with. By studying how bones fit together, scientists are able to see how the animal might have used them.

WADDLING AND WALKING

Rhamphorhyncus (ram-for-hin-kus) could not move its legs as we do. Instead, they were splayed out like a lizard's, so when the animal was on the ground it probably crawled along.

ARMS AND LEGS

Gnathosaurus (na-tho-saw-rus) had a very large head, so it would have tipped over head-first if it had tried to walked on two legs. It could not have crawled like a bat either because it fed in water and would have drowned. Instead, it probably waddled along on its feet and hands, its long wing bones tucked up out of the way.

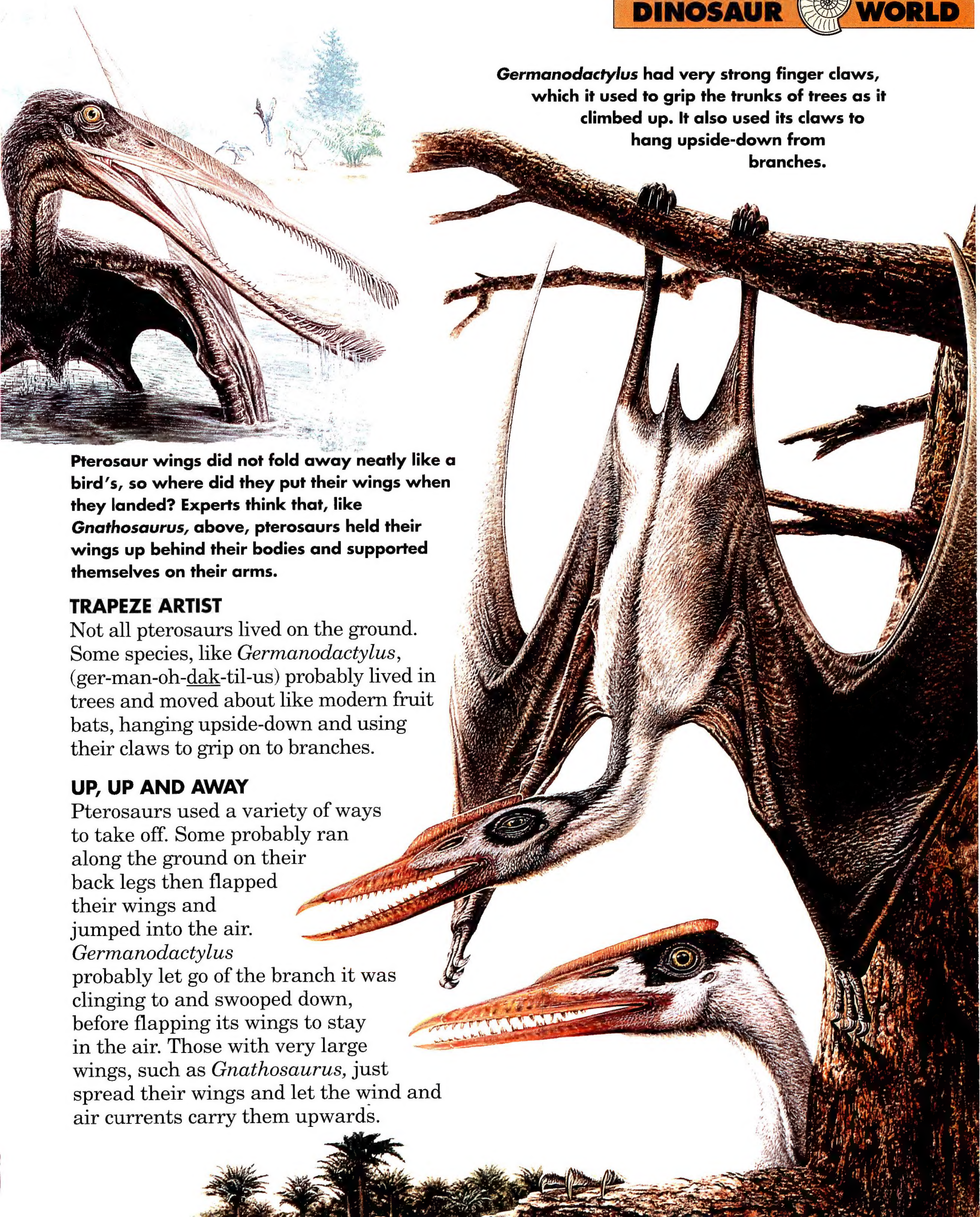


Small pterosaurs like *Batrachognathus* (ba-tra-cog-nay-thus), which was about the size of a crow, could perch on branches using feet and hands.

IT'S A FACT

RIDING THE CRESTS OF THE WAVES

Pterosaurs sometimes landed on the sea. They used the waves and strong, frog-like kicks with their feet to give them the lift they needed to get back into the air. Some pterosaurs had webbed feet, rather like a duck, and these helped them swim. Some scientists believe that pterosaurs with tails may have used them as rudders to help them steer in the water.



Germanodactylus **had very strong finger claws, which it used to grip the trunks of trees as it climbed up. It also used its claws to hang upside-down from branches.**

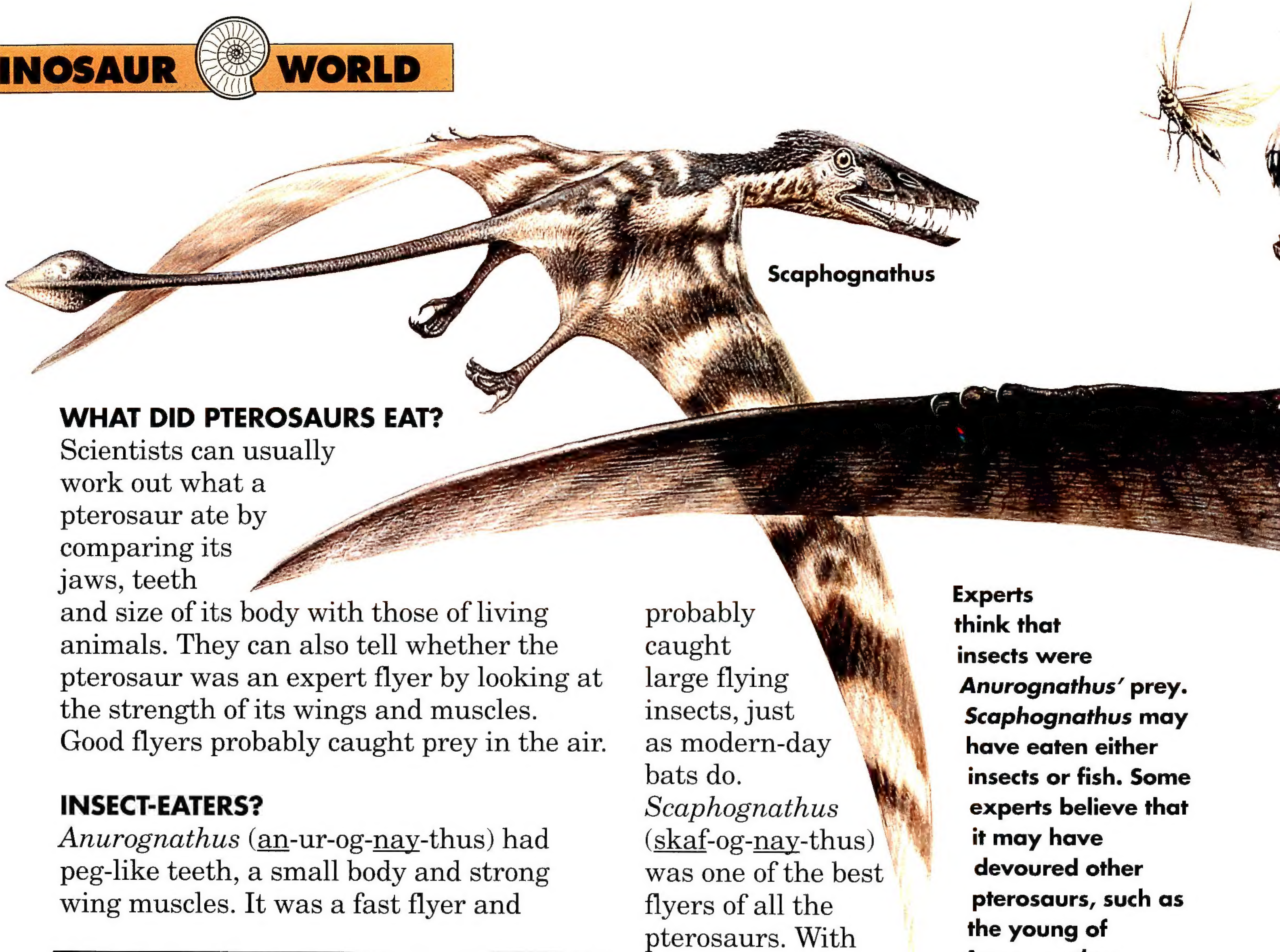
Pterosaur wings did not fold away neatly like a bird's, so where did they put their wings when they landed? Experts think that, like *Gnathosaurus,* above, pterosaurs held their wings up behind their bodies and supported themselves on their arms.

TRAPEZE ARTIST

Not all pterosaurs lived on the ground. Some species, like *Germanodactylus*, (ger-man-oh-dak-til-us) probably lived in trees and moved about like modern fruit bats, hanging upside-down and using their claws to grip on to branches.

UP, UP AND AWAY

Pterosaurs used a variety of ways to take off. Some probably ran along the ground on their back legs then flapped their wings and jumped into the air. *Germanodactylus* probably let go of the branch it was clinging to and swooped down, before flapping its wings to stay in the air. Those with very large wings, such as *Gnathosaurus,* just spread their wings and let the wind and air currents carry them upwards.



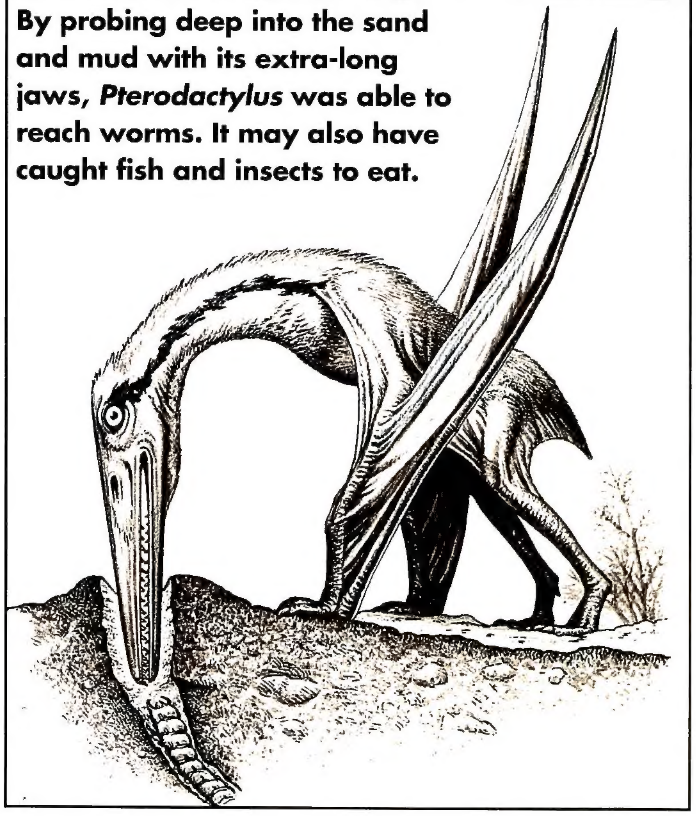
Experts think that insects were *Anurognathus'* prey. *Scaphognathus* may have eaten either insects or fish. Some experts believe that it may have devoured other pterosaurs, such as the young of *Anurognathus.*

WHAT DID PTEROSAURS EAT?

Scientists can usually work out what a pterosaur ate by comparing its jaws, teeth and size of its body with those of living animals. They can also tell whether the pterosaur was an expert flyer by looking at the strength of its wings and muscles. Good flyers probably caught prey in the air.

INSECT-EATERS?

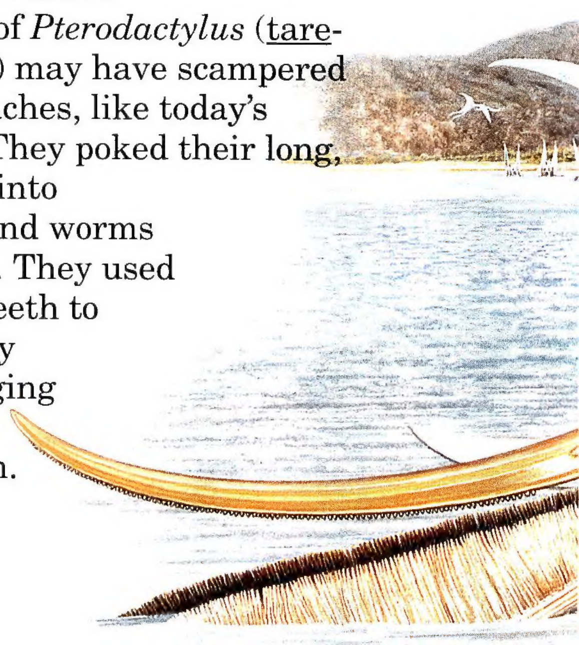
Anurognathus (an-ur-og-nay-thus) had peg-like teeth, a small body and strong wing muscles. It was a fast flyer and probably caught large flying insects, just as modern-day bats do. *Scaphognathus* (skaf-og-nay-thus) was one of the best flyers of all the pterosaurs. With its long jaws, sharp fangs and long, balancing tail, it swept out of the sky, probably catching insects. However, experts are not sure exactly what *Scaphognathus* ate.



By probing deep into the sand and mud with its extra-long jaws, *Pterodactylus* was able to reach worms. It may also have caught fish and insects to eat.

PROBING THE SAND

Small flocks of *Pterodactylus* (tare-oh-dak-til-us) may have scampered along the beaches, like today's shore birds. They poked their long, narrow jaws into the sand to find worms and shellfish. They used their sharp teeth to grasp slippery worms, dragging them out to swallow them.



Anurognathus

Is it true that pterosaurs that ate fish produced pellets of undigested food?

Yes. Most pterosaurs swallowed their food as quickly as they could, because other animals always tried to steal their prey. Bolting food meant that they ate many things that they couldn't digest, such as bones, fish scales and tough skin. After the pterosaur had digested most of its meal, it brought these parts back up in a pellet, just as owls do.

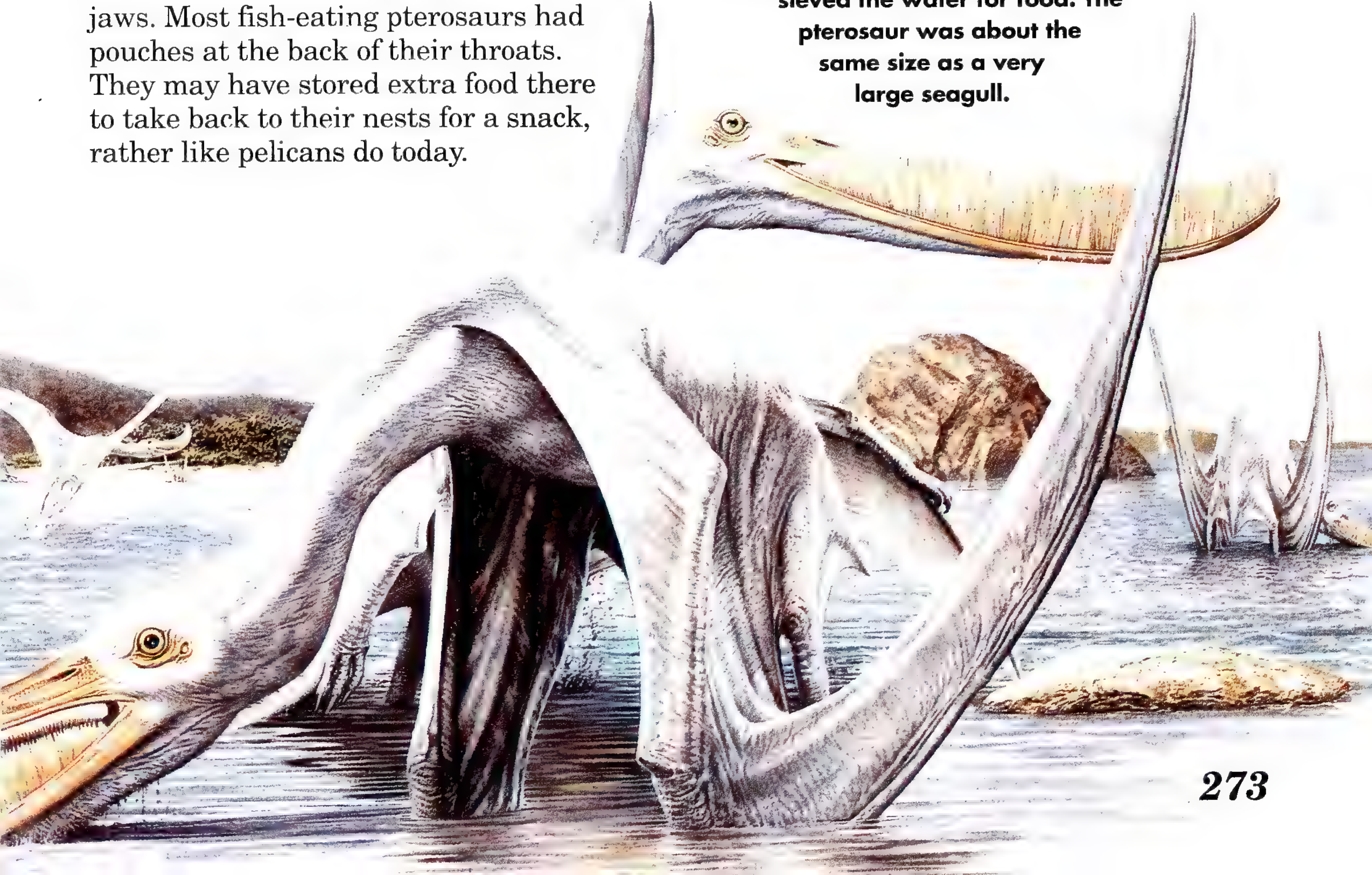
CATCHING FISH

The fish-eating *Gallodactylus* (gal-oh-dak-til-us) had forward-pointing teeth to catch and keep hold of slithery fish. Experts think that some pterosaurs dived straight into the water to catch fish, while others flew low over the surface of the water, scooping up fish in their open jaws. Most fish-eating pterosaurs had pouches at the back of their throats. They may have stored extra food there to take back to their nests for a snack, rather like pelicans do today.

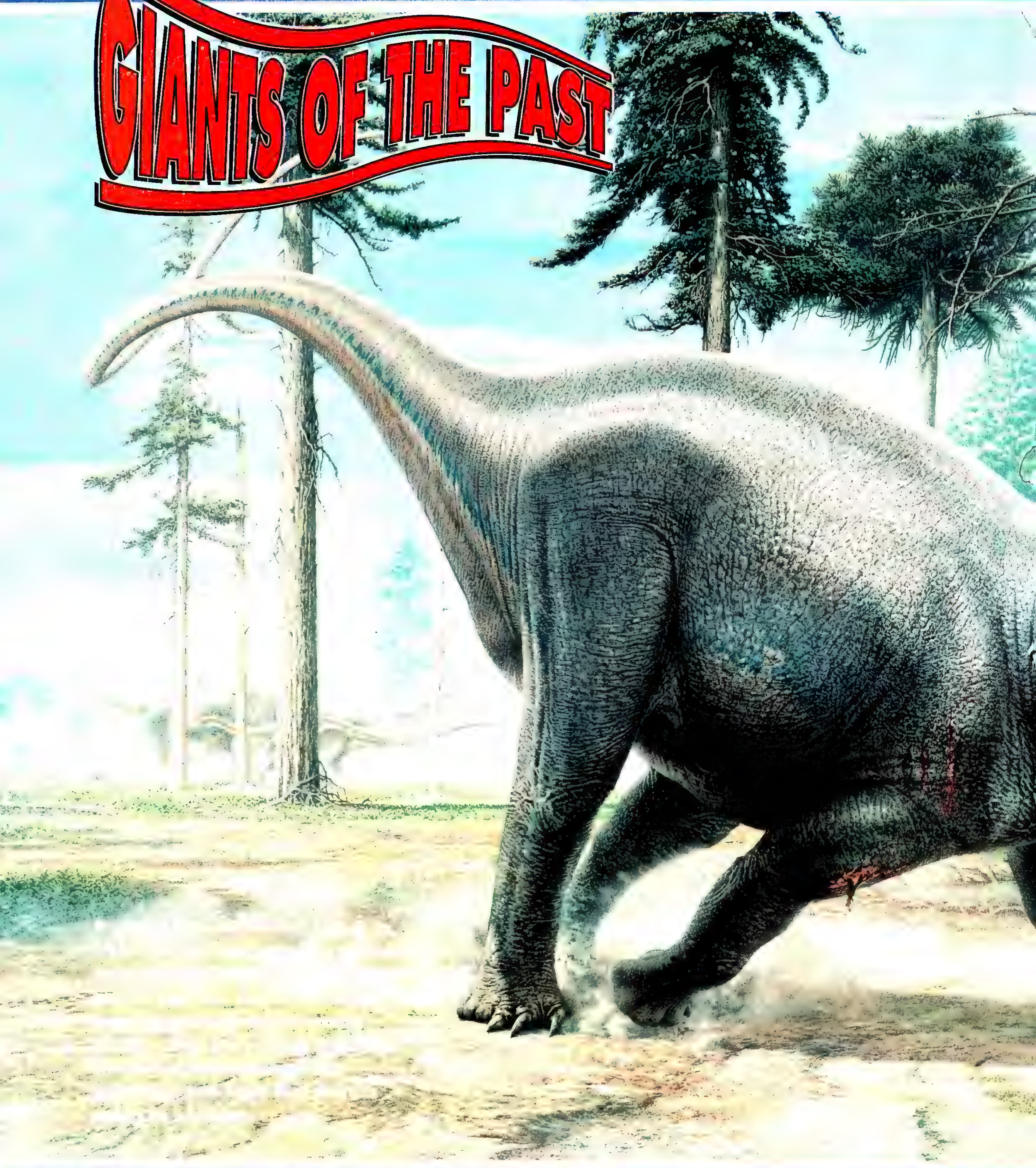
THE BIG SIEVE

Pterodaustro (tare-oh-daws-tro) had a bottom jaw packed with about 1000 bristles, which it used as a sieve to strain microscopic animals out of the water. The pterosaur's thin top jaw had much shorter teeth, which it used to chop up its food.

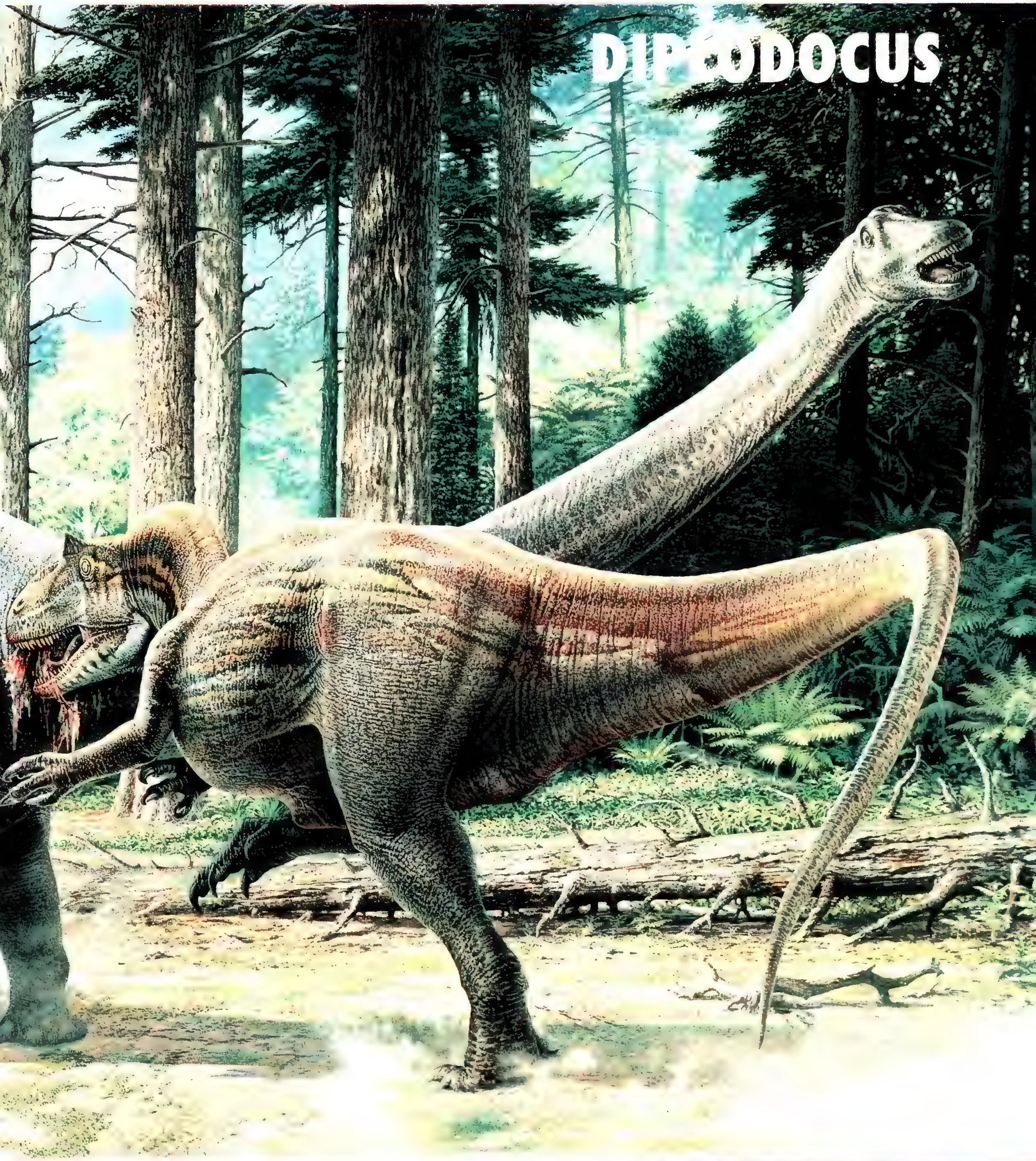
In the Early Cretaceous, *Pterodaustro* fed in shallow water, resting on its front legs while it sieved the water for food. The pterosaur was about the same size as a very large seagull.



GIANTS OF THE PAST



DIPLODOCUS



3-D Gallery

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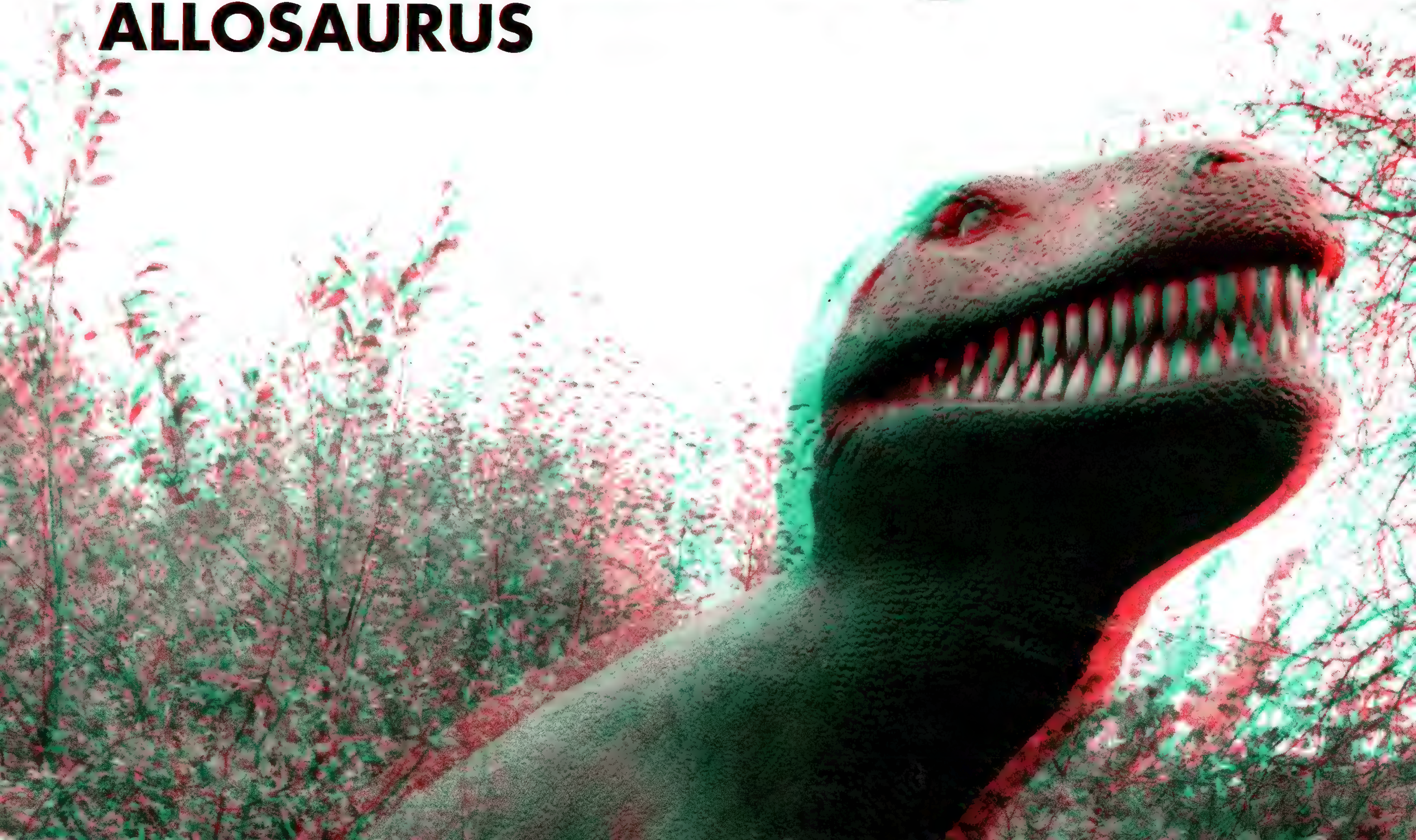
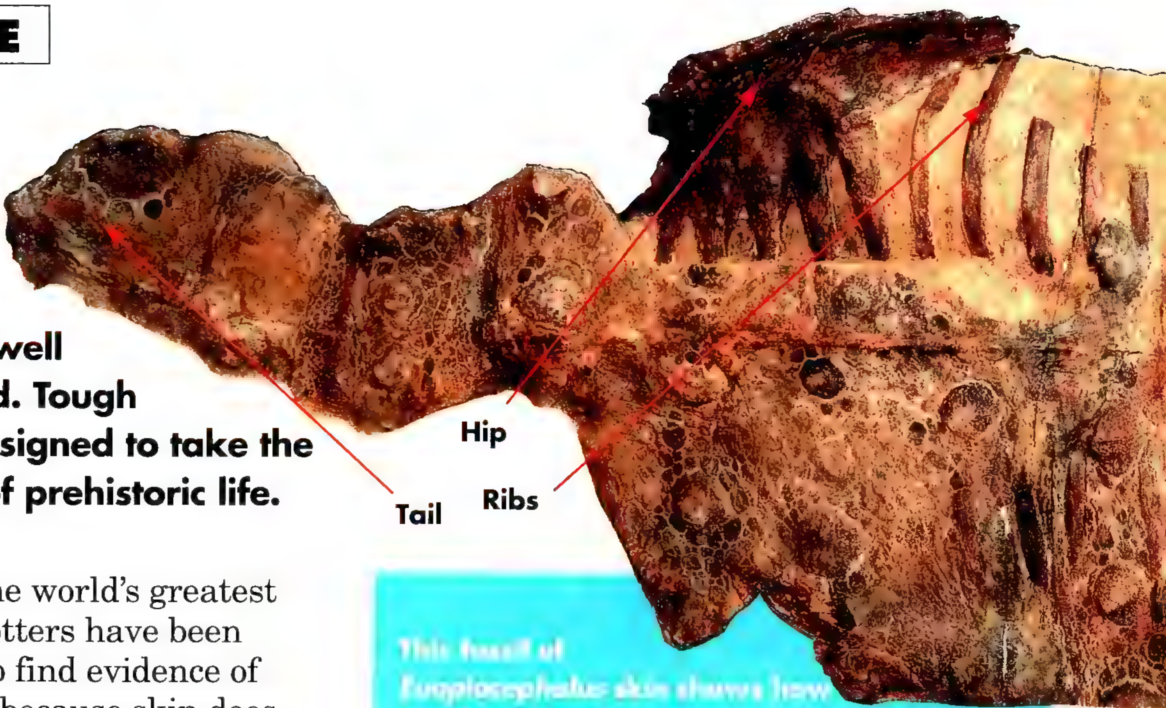
ALLOSAURUS



- Large predator of the Late Jurassic
- Lived 152 – 145 million years ago in North America
- Measured 12m long
- Ate meat

Skin



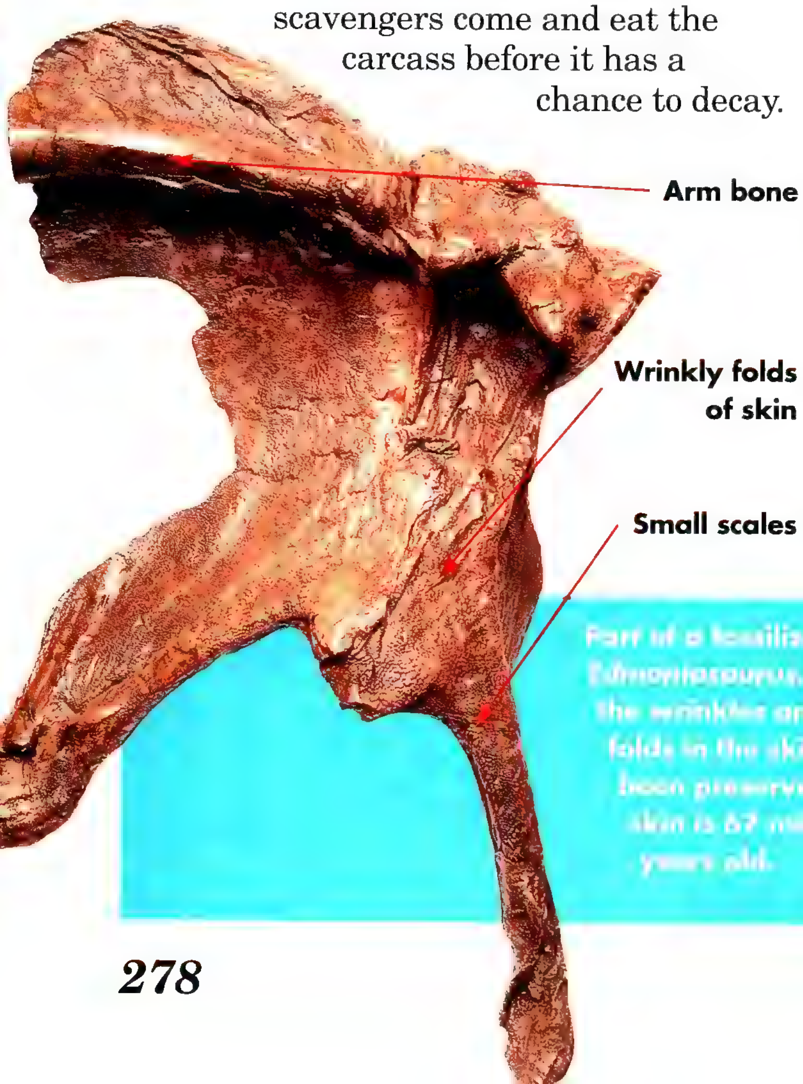
This fossil of *Euoplocephalus* skin shows how tough and leathery armour-plated skin was.

Dinosaur skin was well suited to life on land. Tough and scaly, it was designed to take the rough and tumble of prehistoric life.

Some of the world's greatest fossil spotters have been unable to find evidence of dinosaur skin. This is because skin does not fossilize easily.

THE FIRST TO GO

Often the skin is destroyed before it has a chance to fossilize. When an animal dies in the wild, the skin and flesh are the first part of the body to rot. Also, hungry scavengers come and eat the carcass before it has a chance to decay.



Part of a fossilized *Edmontosaurus*. Even the wrinkles and folds in the skin have been preserved. This skin is 67 million years old.

AN EXCEPTION TO THE RULE

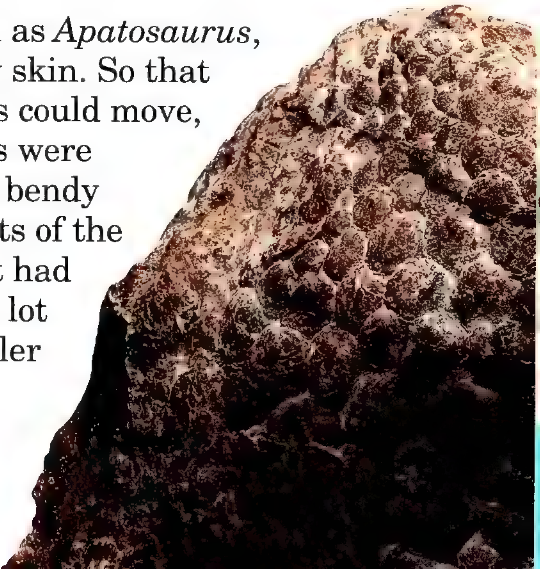
Amazingly, fossilized prints of duckbilled dinosaurs' skin have been found in Canada. Experts think that the dry places in which these dinosaurs lived meant that when they died their skin became hard and leathery very quickly. Sand blew over the carcasses, and the hadrosaurs' skin was preserved as prints in the sand.

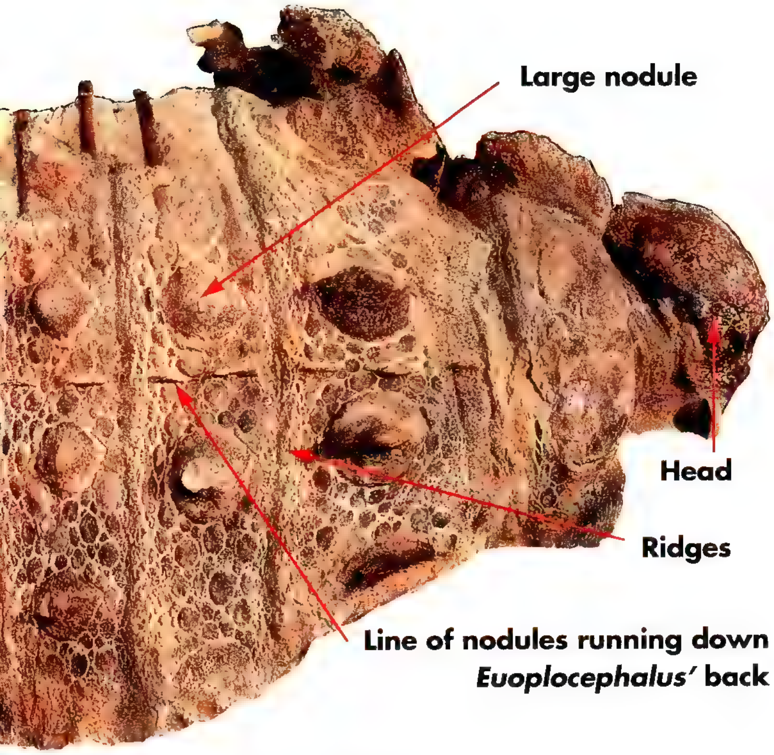
PROTECTIVE SKIN

Dinosaur skin was not moist like that of newts and frogs – it was dry. Like our skin, it kept out the rain and damp. It was perfectly suited to life on dry land and protected the dinosaur from injury.

BENDY SKIN

Sauropods, such as *Apatosaurus*, had scaly skin. So that dinosaurs could move, the scales were joined by bendy skin. Parts of the body that had to bend a lot had smaller scales.





What is? CAMOUFLAGE

Animals that blend in well with their surroundings are said to be camouflaged. Just as soldiers smear their faces with dark paint and wear clothes that match the land around them, dinosaur skin was probably patterned and coloured to make it easier for dinosaurs to hide from their enemies.

LUMPS AND BUMPS

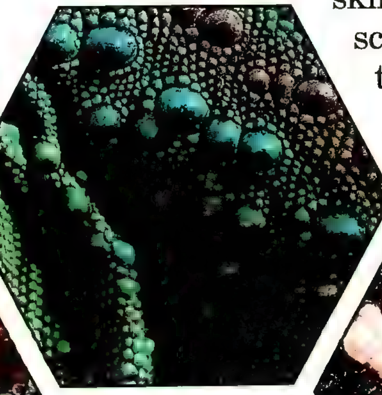
Armour-plated dinosaurs fossilized relatively easily. *Euoplocephalus* had bony lumps and nodules (bumps) for protection. Today's crocodiles have similar nodules.

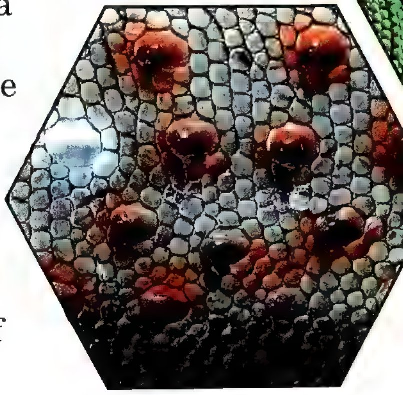
SCALY SKIN

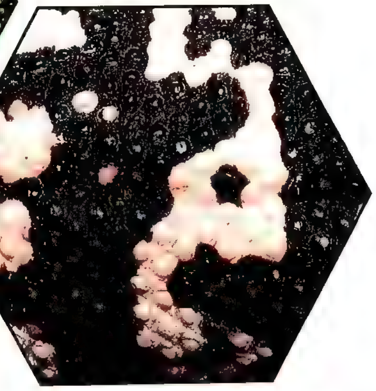
Some living reptiles, like the sungazer lizard, have scales that overlap, like tiles on a roof. Others, such as the gila monster, have scales that join neatly together, like tiles in a bathroom. Dinosaurs also had two different types of skin, depending on whether their skin was armoured or flexible.

MULTI-COLOURED COAT

When artists paint dinosaurs they often make them camouflaged, but no one knows what colour they were. Some living reptiles are brightly coloured. Skin colour helps them hide, attract a mate and control body temperature. For all we know, dinosaur skin was as colourful, scaly and bumpy as that of the modern lizards below.


Iguana


Gecko


Gila monster

Tough scales on a sauropod's skin (left) join together, but do not overlap.

The sungazer lizard's scales overlap.

Meet the roof lizards

Their spiked backs and tails make the stegosaurs an easy group to spot.

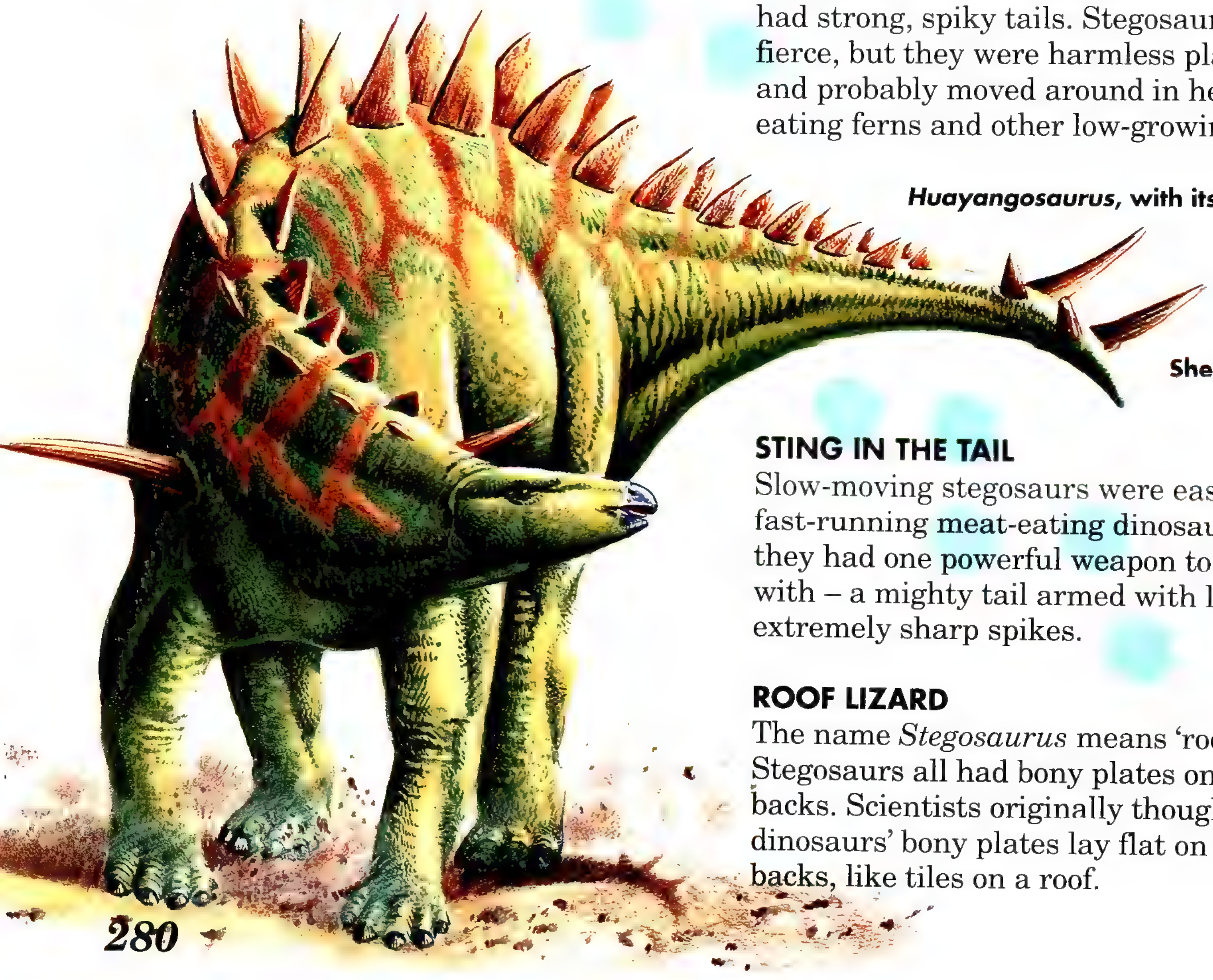
Stegosaurs are named after one of the best known dinosaurs, *Stegosaurus*. The group contains two families. The first has only one member, called *Huayangosaurus*. The second contains not only *Stegosaurus*, but about 14 others as well.

LONG AND SHORT

Huayangosaurus is the earliest known stegosaur. It was about 4m long and shorter than a man. *Stegosaurus* was much bigger. It was more than twice as tall and measured up to 7.5m long.

PIN HEADS

All the stegosaurs had small heads and big bodies. Two rows of tall, pointed plates of bony skin ran down their backs and they had strong, spiky tails. Stegosaurs looked fierce, but they were harmless plant-eaters and probably moved around in herds eating ferns and other low-growing plants.



***Huayangosaurus*, with its off-putting display of spikes, was about as big as a Shetland pony.**

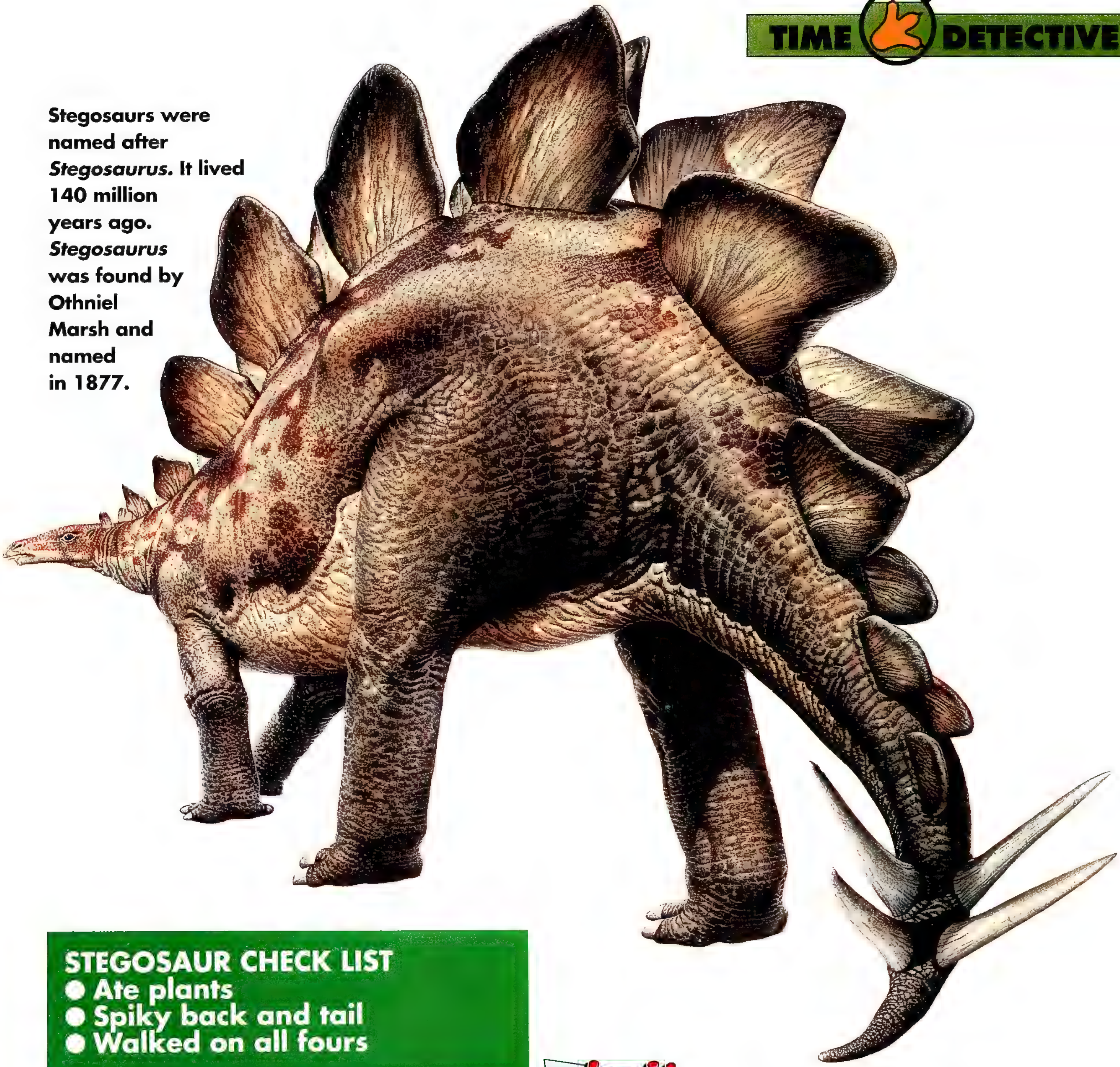
STING IN THE TAIL

Slow-moving stegosaurs were easy prey for fast-running meat-eating dinosaurs. But they had one powerful weapon to lash out with – a mighty tail armed with long, extremely sharp spikes.

ROOF LIZARD

The name *Stegosaurus* means ‘roof lizard’. Stegosaurs all had bony plates on their backs. Scientists originally thought the dinosaurs’ bony plates lay flat on their backs, like tiles on a roof.

Stegosaurs were named after *Stegosaurus*. It lived 140 million years ago. *Stegosaurus* was found by Othniel Marsh and named in 1877.



STEGOSAUR CHECK LIST

- Ate plants
- Spiky back and tail
- Walked on all fours

HOT AND COLD

Scientists now believe the plates stood upright, more like a spiky fence. They also think they could have been used to help control the stegosaur's body temperature. Tests have shown that the diamond-shaped plates on *Stegosaurus* were just the right shape to absorb and hold the heat from the sun to keep the dinosaur warm, or to help cool it down quickly in a breeze.

Is it true that *Stegosaurus* had two brains?

Some people believe that the hollow in part of *Stegosaurus'* spine near its hind legs could have been a space for an extra brain. However, scientists now think this is unlikely. They believe it was where all the nerves of the hind legs and tail met and that it was really a kind of relay station to send messages to and from the brain.

ALL SORTS

Every stegosaur had back plates but the shapes and sizes were often very different. *Kentrosaurus* had more than one plate shape – they were broad at the shoulder and spiky further down.

The plates were not fixed to the skeleton. They were embedded in the stegosaur's thick skin. Apart from its plates, *Stegosaurus* had smaller hard knobs and bumps all over its body.

TINY BRAINS

Stegosaurs had very small brains compared with their body size. For example, *Stegosaurus* had a tiny brain that was no bigger than a walnut. Their brains may have been small but they did the job – stegosaurs survived for more than 100 million years throughout the world.

LIVING THROUGH THE AGES

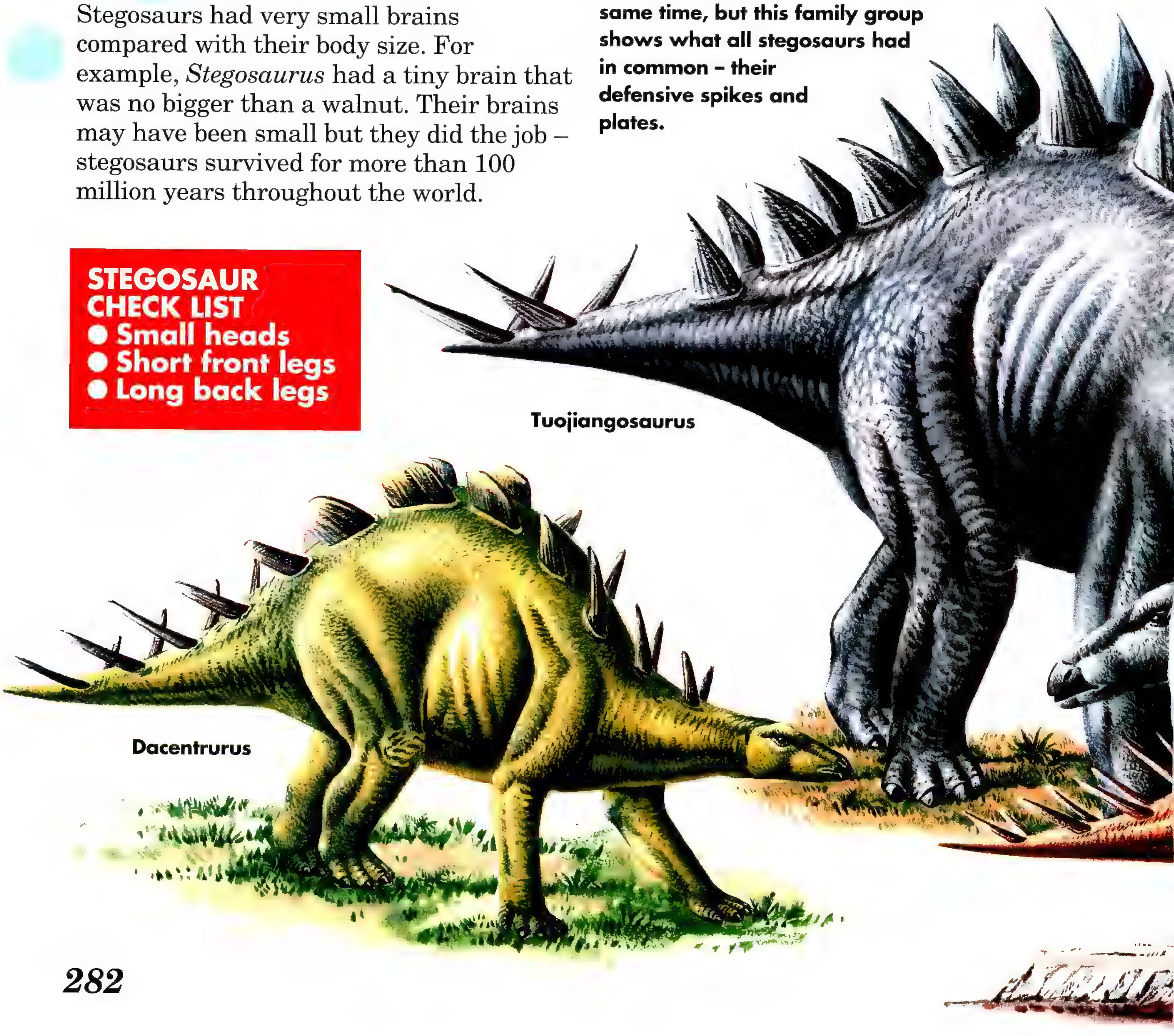
Huayangosaurus, Lexovisaurus and *Dacentrurus* were some of the earliest stegosaurs. They lived in Middle Jurassic times about 170 million years ago.

Most stegosaurs, including *Stegosaurus*, *Kentrosaurus* and *Tuojiangosaurus* lived in the Late Jurassic Period. *Wuerhosaurus,* a Chinese dinosaur, was one of the few stegosaurs from the Early Cretaceous Period, 110 million years ago.

Not all the stegosaurs below lived at the same time, but this family group shows what all stegosaurs had in common – their defensive spikes and plates.

STEGOSAUR CHECK LIST

- Small heads
- Short front legs
- Long back legs



WORLD WIDE

Stegosaurs lived all over the world. *Lexovisaurus* and *Dacentrurus* came from Europe. *Kentrosaurus* lived in Africa. *Stegosaurus* roamed North America, and *Huayangosaurus, Tuojiangosaurus* and *Wuerhosaurus* lived in China.

CHINESE PUZZLE

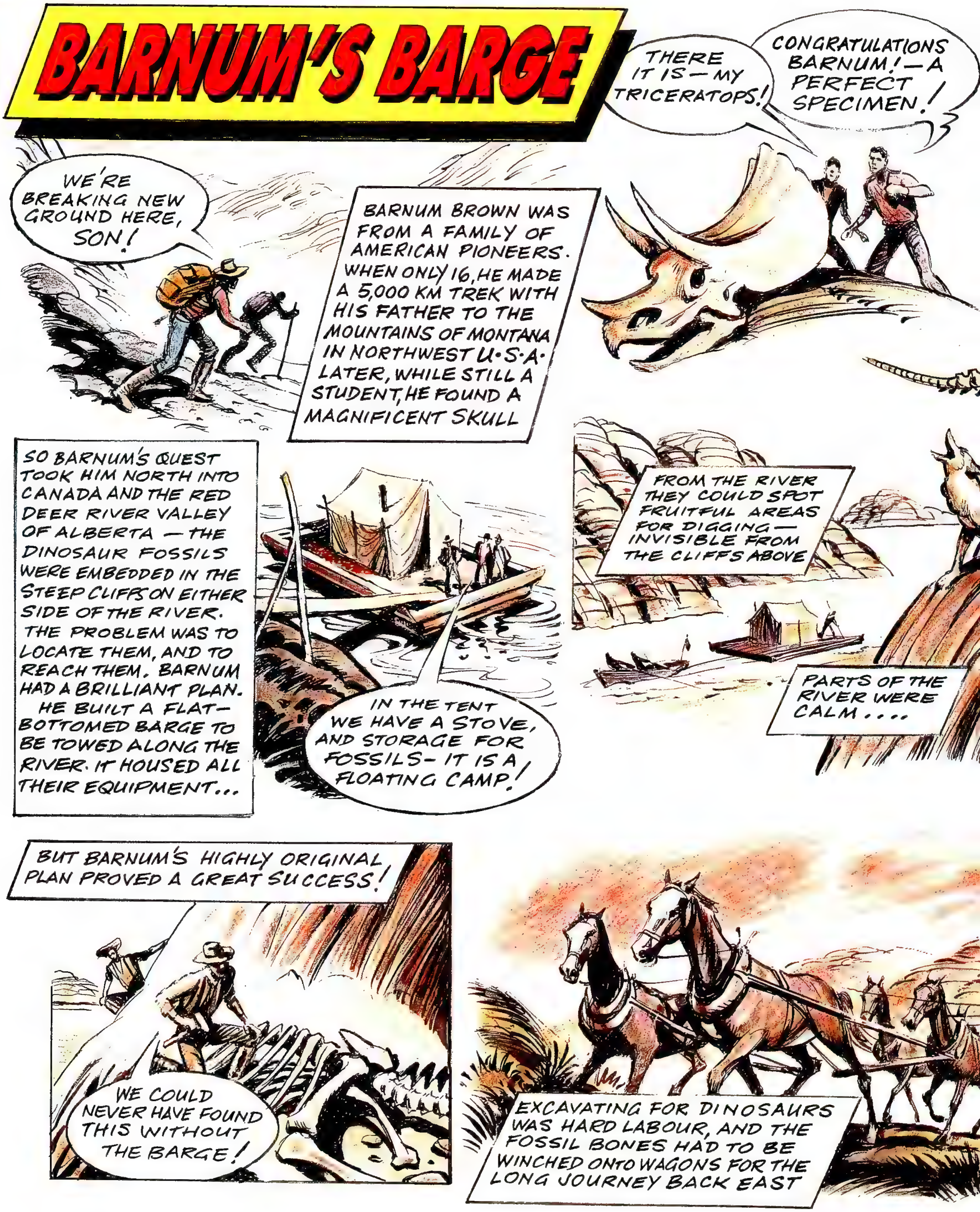
How stegosaurs spread from China is a bit of a mystery because Asia was cut off from the rest of the world by sea for most of the Age of the Dinosaurs. Dinosaur experts now think Asia and Europe must have been linked for a short time.

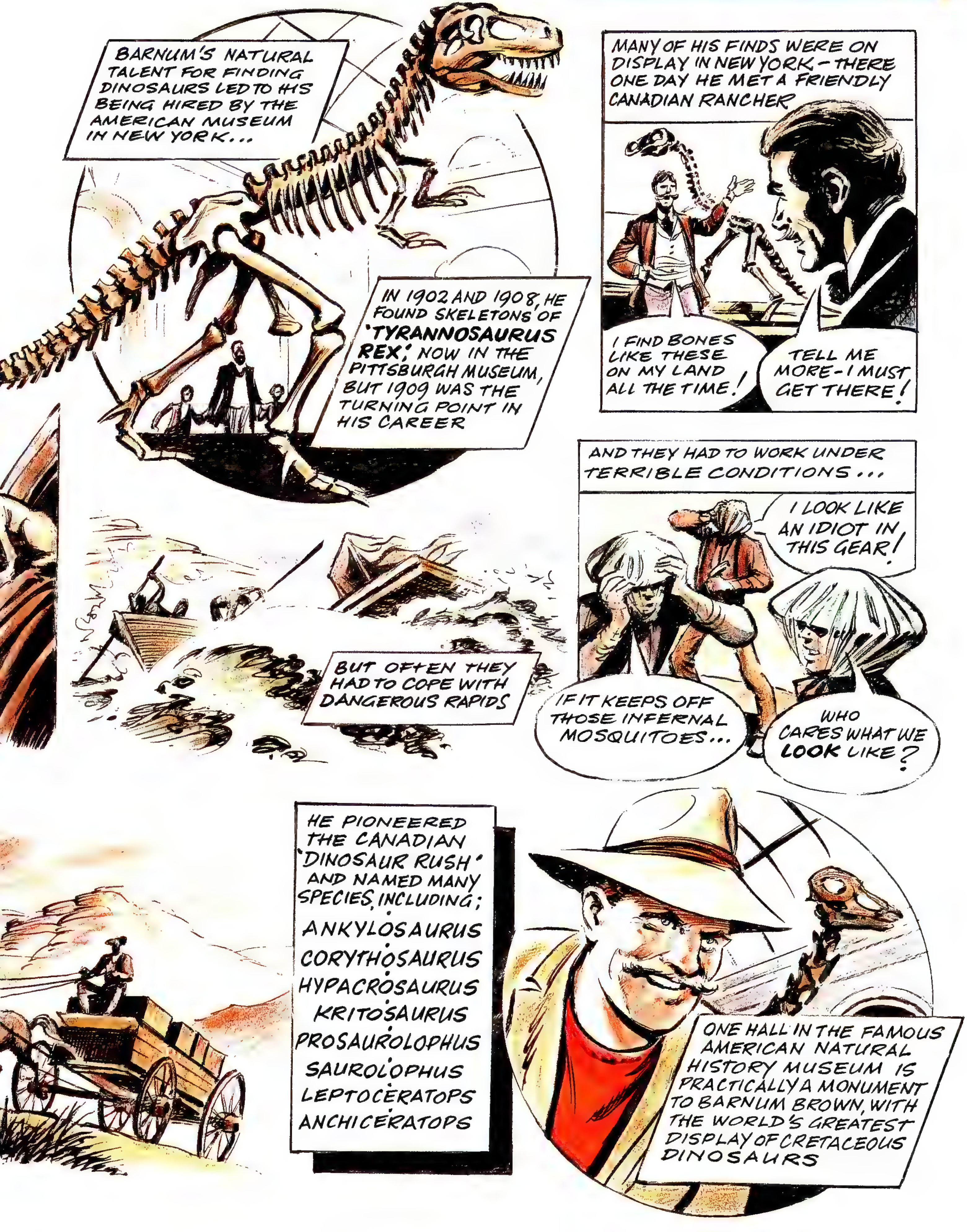
IT'S A FACT

SWALLOWING STONES

Stegosaurus needed to eat a lot to survive, but it was not much good at chewing. To help digest its food, the dinosaur swallowed stones and kept them in its stomach to grind down tough plants. Modern birds don't have any teeth, so they reduce their food to a pulp in a sack near their stomach, called a gizzard. To help speed up this process birds sometimes swallow pebbles, just like *Stegosaurus*.

BARNUM'S BARGE


WE'RE BREAKING NEW GROUND HERE, SON!
BARNUM BROWN WAS FROM A FAMILY OF AMERICAN PIONEERS. WHEN ONLY 16, HE MADE A 5,000 KM TREK WITH HIS FATHER TO THE MOUNTAINS OF MONTANA IN NORTHWEST U.S.A. LATER, WHILE STILL A STUDENT, HE FOUND A MAGNIFICENT SKULL
THERE IT IS — MY TRICERATOPS!
CONGRATULATIONS BARNUM! — A PERFECT SPECIMEN!
SO BARNUM'S QUEST TOOK HIM NORTH INTO CANADA AND THE RED DEER RIVER VALLEY OF ALBERTA — THE DINOSAUR FOSSILS WERE EMBEDDED IN THE STEEP CLIFFS ON EITHER SIDE OF THE RIVER. THE PROBLEM WAS TO LOCATE THEM, AND TO REACH THEM. BARNUM HAD A BRILLIANT PLAN. HE BUILT A FLAT-BOTTOMED BARGE TO BE TOWED ALONG THE RIVER. IT HOUSED ALL THEIR EQUIPMENT...
IN THE TENT WE HAVE A STOVE, AND STORAGE FOR FOSSILS — IT IS A FLOATING CAMP!
FROM THE RIVER THEY COULD SPOT FRUITFUL AREAS FOR DIGGING — INVISIBLE FROM THE CLIFFS ABOVE
PARTS OF THE RIVER WERE CALM....
BUT BARNUM'S HIGHLY ORIGINAL PLAN PROVED A GREAT SUCCESS!
WE COULD NEVER HAVE FOUND THIS WITHOUT THE BARGE!
EXCAVATING FOR DINOSAURS WAS HARD LABOUR, AND THE FOSSIL BONES HAD TO BE WINCHED ONTO WAGONS FOR THE LONG JOURNEY BACK EAST


BARNUM'S NATURAL TALENT FOR FINDING DINOSAURS LED TO HIS BEING HIRED BY THE AMERICAN MUSEUM IN NEW YORK...
IN 1902 AND 1908, HE FOUND SKELETONS OF **'TYRANNOSAURUS REX,'** NOW IN THE PITTSBURGH MUSEUM, BUT 1909 WAS THE TURNING POINT IN HIS CAREER
MANY OF HIS FINDS WERE ON DISPLAY IN NEW YORK – THERE ONE DAY HE MET A FRIENDLY CANADIAN RANCHER
I FIND BONES LIKE THESE ON MY LAND ALL THE TIME!
TELL ME MORE – I MUST GET THERE!
BUT OFTEN THEY HAD TO COPE WITH DANGEROUS RAPIDS
AND THEY HAD TO WORK UNDER TERRIBLE CONDITIONS...
I LOOK LIKE AN IDIOT IN THIS GEAR!
IF IT KEEPS OFF THOSE INFERNAL MOSQUITOES...
WHO CARES WHAT WE **LOOK** LIKE?
HE PIONEERED THE CANADIAN 'DINOSAUR RUSH' AND NAMED MANY SPECIES, INCLUDING;
ANKYLOSAURUS
CORYTHOSAURUS
HYPACROSAURUS
KRITOSAURUS
PROSAUROLOPHUS
SAUROLOPHUS
LEPTOCERATOPS
ANCHICERATOPS
ONE HALL IN THE FAMOUS AMERICAN NATURAL HISTORY MUSEUM IS PRACTICALLY A MONUMENT TO BARNUM BROWN, WITH THE WORLD'S GREATEST DISPLAY OF CRETACEOUS DINOSAURS

Improve and test your knowledge with...

DINO Fact File

Triceratops holds all the answers. See how you score in the quiz.

1 What was *Anurognathus?*

a) a dinosaur
b) a prehistoric fish
c) a pterosaur

2 What is the modern name for the country where *Kentrosaurus* was found?

a) Ethiopia
b) Zimbabwe
c) Tanzania

3 Do today's experts believe that *Hypsilophodon* climbed trees?

a) yes
b) no
c) yes, but only to feed

4 How long was *Dicraeosaurus?*

a) as long as a car
b) as long as two buses
c) as long as a train

5 How many vertebrae did *Diplodocus* have altogether?

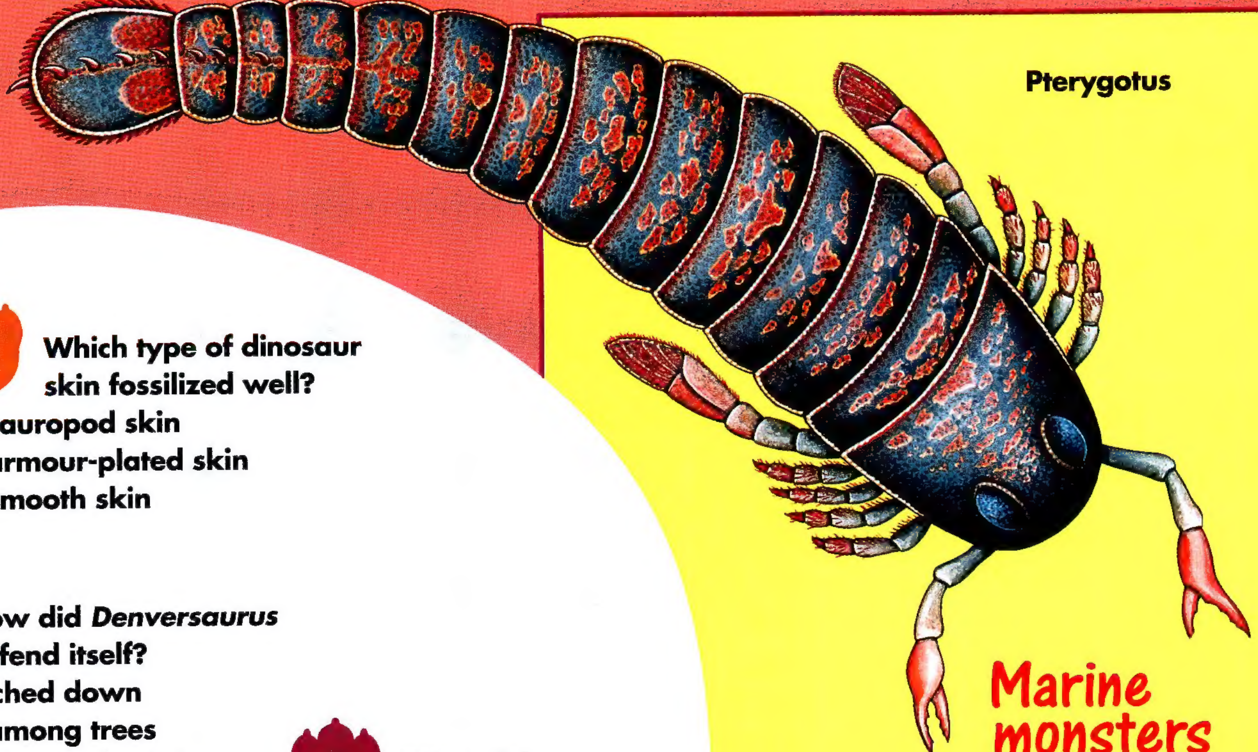
a) about 95
b) about 30
c) about 195

No frills attached

Many films have been made about dinosaurs. Some have used models, some employ people wearing costumes, while others feature living lizards. The film 'One Million B.C.' used monitor lizards with rubber spines and frills glued to their bodies. These animals were so badly treated that the American Society for Prevention of Cruelty to Animals banned the use of lizards in later films.

A living dinosaur

People who live in the vast swamps that lie on the border of Zaire in Africa claim to have seen a living dinosaur. From their descriptions, some scientists believe it to be a sauropod like Astrodon. However, it is unlikely and the sightings are probably of river elephants, hippopotamuses or floating logs.



Pterygotus

6 Which type of dinosaur skin fossilized well?

a) sauropod skin
b) armour-plated skin
c) smooth skin

7 How did *Denversaurus* defend itself?

a) it crouched down
b) it hid among trees
c) it stood on its back legs

8 What did *Dilophosaurus* eat?

a) leaves
b) insects
c) dead animals

9 Which pterosaur hung upside-down in trees?

a) *Gnathosaurus*
b) *Germanodactylus*
c) *Pterodaustro*

10 How many brains did *Stegosaurus* have?

a) three
b) two
c) one

Marine monsters

Over 400 million years ago, giant sea scorpions called eurypterids (you-rip-ter-ids) prowled Earth's oceans, hunting smaller sea creatures. Some of these animals, such as Pterygotus, grew up to 2.5m long – that's about as long as a dolphin. They died out just before the dinosaurs appeared on Earth.

Lucky survivors

There have been several times in the history of life on Earth when large numbers of animals have died out. About 225 million years ago, about the same time as the dinosaurs appeared, over 90% of all animal species died out.

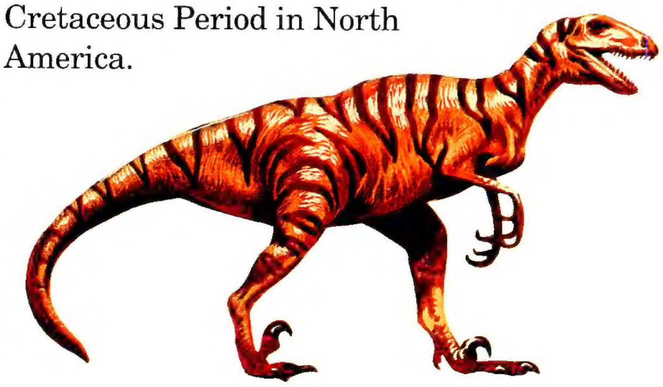
Sticking your neck out

The giant sea reptile called Elasmosaurus had a very long, flexible neck. It measured 8m long, over half the animal's entire length. Elasmosaurus had over 70 neck bones in all. The giraffe has the longest neck of any animal alive today and has only seven neck bones.

Answers to the questions on inside back cover

DEINONYCHUS 115 MYA

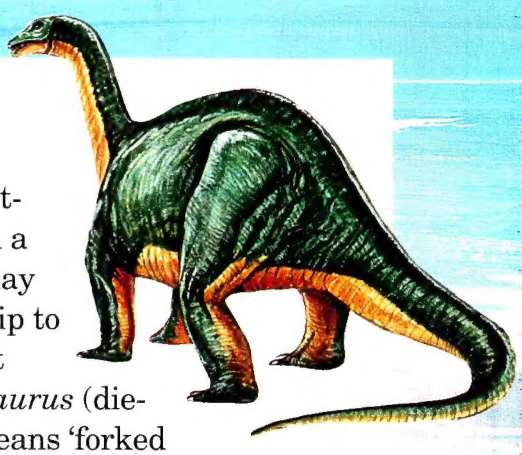
Deinonychus (die-no-nike-us) was light and strong with long, slender legs that helped it to run fast – possibly up to 40 km/h. This dinosaur, which was about the size of a small car, ran about on its back legs and could escape quickly from larger predators and chase after prey. Its muscular tail may also have been used as a rudder to steer a path through the rocky prehistoric landscape. *Deinonychus* had a large, curved claw on the second toe of its foot, which could cut through prey like a scythe. Its name, not surprisingly, means 'terrible claw'. This agile dinosaur hunted in packs in the Early Cretaceous Period in North America.



DENVERSAURUS 80 MYA

Denversaurus (den-ver-saw-rus) was first named when a squashed skull was dug out of the ground in South Dakota, USA, in 1988. It fed among the low-lying plants of the Late Cretaceous Period and walked on four legs. *Denversaurus* probably defended itself against predators by crouching down so that its soft underbelly was protected by its armoured back and tail. This dinosaur was between 4 and 5m long and its name means 'Denver lizard'.

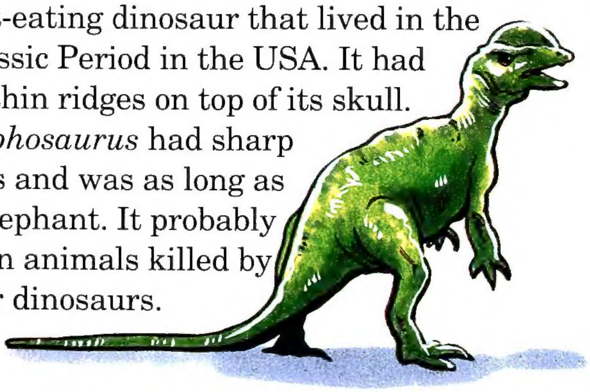
DICRAEOSAURUS 145 MYA



This enormous plant-eating dinosaur had a long tail, which it may have used like a whip to defend itself against predators. *Dicraeosaurus* (die-kray-oh-saw-rus) means 'forked reptile' because of its Y-shaped vertebrae (backbones). It lived in Tanzania, Africa, in the Late Jurassic Period. *Dicraeosaurus* was as long as two double-decker buses and weighed four times as much as a rhinoceros.

DILOPHOSAURUS 190 MYA

Dilophosaurus (die-loaf-oh-saw-rus) was a meat-eating dinosaur that lived in the Jurassic Period in the USA. It had two thin ridges on top of its skull. *Dilophosaurus* had sharp fangs and was as long as an elephant. It probably fed on animals killed by other dinosaurs.



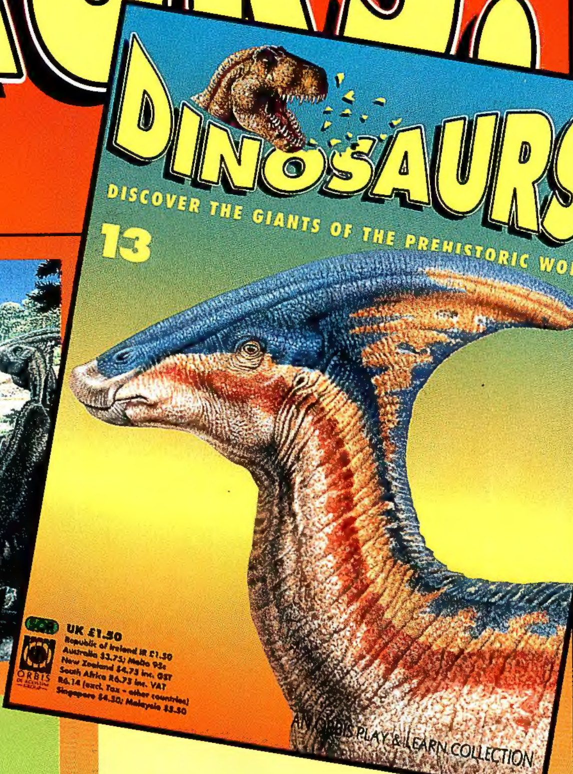
DINODOCUS 125 MYA

This gigantic four-legged dinosaur lived in the south of England. *Dinodocus* (die-no-doh-kus) was a four-legged plant-eater and looked rather like a huge giraffe. Although little is known about this dinosaur, it is thought to have been as long as a railway carriage. *Dinodocus* means 'terrible beam'.

MYA = MILLION YEARS AGO

COMING IN PART 13 OF

DINOSAURS!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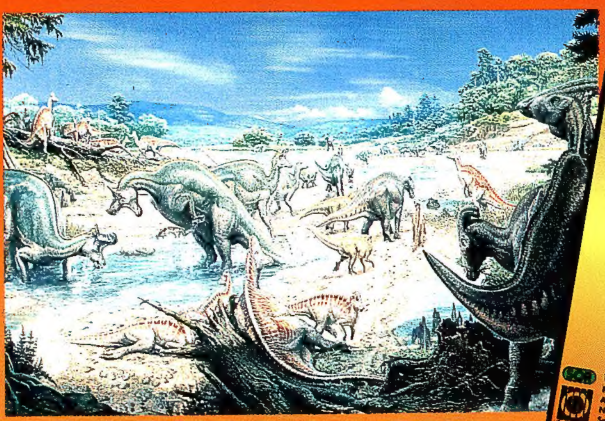
Meet the thick-heads in TIME DETECTIVE.

AND: IDENTIKIT looks at crested *Parasaurolophus*, chicken-sized *Compsognathus* and heavily armoured *Edmontonia*.



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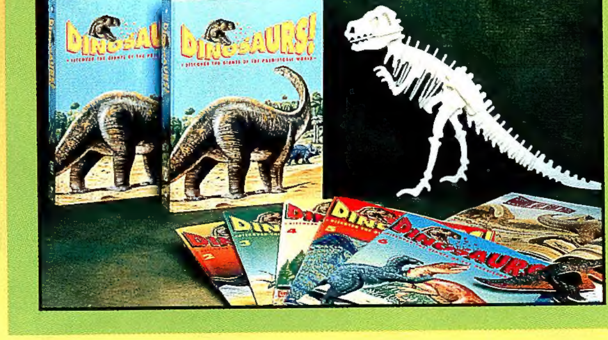

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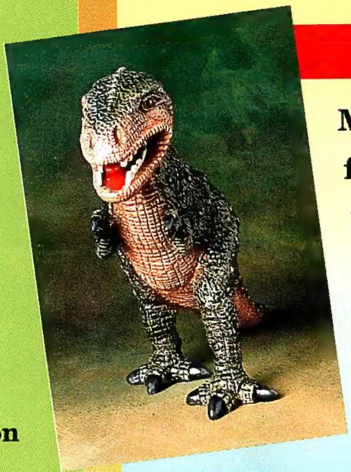

PLUS

More parts for your *T rex* body model.

AND

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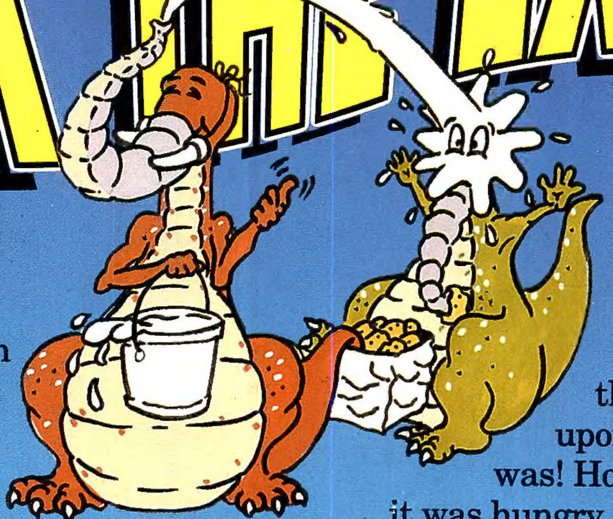
DINOSAUR WORLD
HISTORY IN PICTURES

ANSWERS TO DINO FACT FILE QUESTIONS: 1.c 2.c 3.b 4.b 5.a 6.b 7.a 8.c 9.b 10.c

Dr. David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

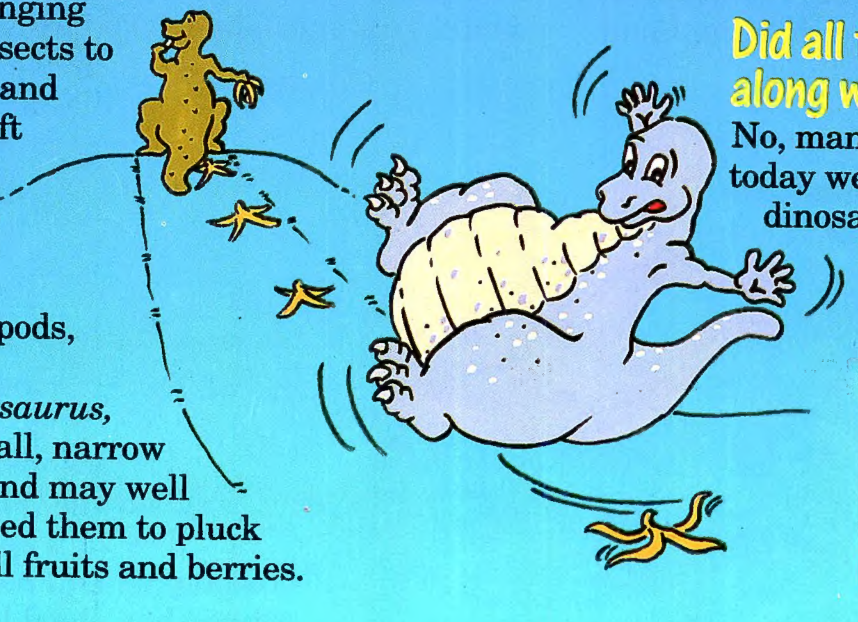


Did dinosaurs have trunks?

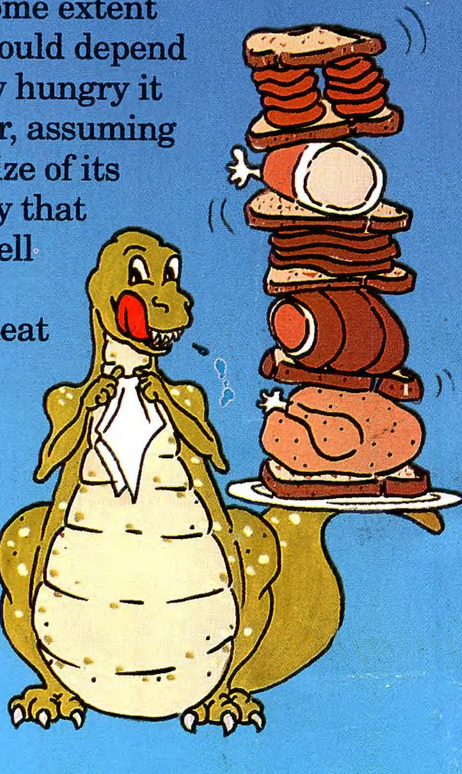
Some dinosaurs, such as *Diplodocus*, *Camarasaurus* and *Brachiosaurus*, seem to have had large nostrils on the tops of their snouts. The only animals living today that have similar nostrils are elephants, tapirs and elephant seals – all of which have a sort of trunk. However, there is no evidence that dinosaurs had trunks and it is hard to think why they would have needed them.

Did any dinosaurs eat fruit?

Some dinosaurs, such as the ornithomimosaurs (or-nith-o-mime-o-saws) (bird-mimic dinosaurs), had toothless skulls similar to those of ostriches today, and may well have had a similarly broad diet, ranging from insects to lizards and even soft fruits. Others, such as small ornithopods, like *Lesothosaurus*, had small, narrow beaks and may well have used them to pluck off small fruits and berries.



How much meat could T rex eat in one day?



To some extent that would depend upon how hungry it was! However, assuming it was hungry, the size of its head and belly imply that a large *T rex* may well have consumed as much as 120kg of meat at a meal (three to four average adult humans or six children)! Just one meal would have been enough to keep the dinosaur going for several days until it found another meal.

Did all the reptiles die out along with the last dinosaur?

No, many of the reptiles we know today were around when the dinosaurs died out. They include lizards, snakes, turtles and crocodiles.

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